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CONTENTS

		PAGE
NUMBER 1.	Descendants of the mutineers of the Bounty, by Harry L. Shapiro	1
NUMBER 2.	Growth of children in Hawaii; based on observations by Louis R. Sullivan, by Clark Wissler	107
NUMBER 3.	Dental morphology and pathology of prehistoric Guam, by R. W. Leigh	255
NUMBER 4.	The physical characters of the Society Islanders, by H. L. Shapiro	273
NUMBER 5.	The fishes of Oceania—Supplement 1, by Henry W. Fowler	311
NUMBER 6.	The fishes of Oceania—Supplement 2, by Henry W. Fowler	383

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DESCENDANTS OF THE MUTINEERS OF THE BOUNTY

By Harry L. Shapiro

Memoirs of the Bernice P. Bishop Museum
Volume XI, Number 1

WITH PLATES I-III

PUBLISHED BY THE MUSEUM
HONOLULU, HAWAII
1929

CONTENTS

PAGE

Introduction 3
History 4
Life and customs of the Pitcairn Islanders 9
- Introductory statement 9
- Villages and houses 9
- Furniture 10
- Dress 11
- Navigation and boats 12
- Implements and utensils 13
- Fishing and hunting 14
- Amusements and music 15
- Food and cooking 17
- Industries 18
- Agriculture 20
- Live stock 22
- Position of women 23
- Social relationships 23
- Education 25
- Property 26
- Government 27
- Religion 29
- Mental and moral traits 31

Comparative analysis of anthropometric characters 32
- Method and material 32
- Quantitative and qualitative measurements 33
  - Stature 33
  - Sitting height 34
  - Maximum head length 34
  - Maximum head width 35
  - Head circumference 36
  - Maximum bizygomatic diameter 36
  - Face height 37
  - Maximum frontal diameter 37
  - Bigonial diameter 38
  - Nose height 39
  - Nose width 40
  - Relative sitting height 40
  - Cephalic index 41
  - Facial index 42
  - Cephalo-facial index 43
  - Fronto-parietal index 43
  - Zygomatico-frontal index 44
  - Zygomatico-gonial index 45
  - Nasal index 46
  - Eye color 46
  - Epicanthic fold 47
  - Skin color 48
  - Hair color 49
  - Hair form 50
  - Hair growth 50
  - Forehead 51
    - Slope of forehead 51
    - Glabella 51
  - Nose 52
    - Nasal profile 52
    - Nasal bridge 52
    - Axis of nostrils 53
    - Nasal septum 53
  - Prognathism 54
  - Prominence of the chin 54
  - Lips 54

Position of hybrids in relation to English and Tahitians 55
Qualitative description of the F_1 generation on Pitcairn Island 56
Comparison of Norfolk Islanders with back-crossed hybrids 57
Correlation of Tahitian blood with inheritance 58
Sex differences 58
Variability of Norfolk Islanders 58
Physiology and vital statistics 58
- Genealogies 58
- Population 59
- Fertility 60
- Age at marriage 60
- Birth and care of children 61
- The teeth 61
- Pulse and temperature 62
- Longevity 62
- Disease 62

Summary and conclusions 63
- Historical and social background 63
- Anthropometric methods and results 64
- Comparison of specific characters 64

Explanation of tables 70
Individual records 91
- Key to tables 91

Bibliography 96

ILLUSTRATIONS

Plate I Norfolk Island males.
II Norfolk Island males
III Norfolk Island females

Figure 1. Comparison of statures.
2. Comparison of sitting heights.
3. Comparison of maximum head lengths.
4. Comparison of head breadths.
5. Comparison of minimum frontal diameters.
6. Comparison of bigonial diameters.
7. Comparison of face heights.
8. Comparison of cephalic indices.
9. Comparison of fronto-parietal indices.
10. Comparison of cephalo-facial indices.
11. Comparison of zygomatico-frontal indices.
12. Comparison of facial indices.
13. Comparison of zygomatico-gonial indices.

DESCENDANTS OF THE MUTINEERS OF THE BOUNTY

By Harry L. Shapiro

INTRODUCTION

This memoir deals with the Pitcairn and Norfolk Islanders who are the descendants of an eighteenth century cross between two fairly divergent groups—English and Tahitian. The progeny of this cross, through isolation, developed a social structure peculiar to themselves. In addition, the Norfolk Islanders are of great interest because they are products of at least five generations of close inbreeding. For these reasons I decided to visit the descendants of the "mutineers of the *Bounty*" in order to study their inheritance, society and the effects of inbreeding. I was enabled to make this trip as the result of a Bishop Museum Fellowship awarded in 1923 by Yale University. My plan was to visit Pitcairn Island where a small offshoot of the main colony live, having returned to their original home from Norfolk Island. From Pitcairn I proposed to go to Norfolk.

I left Panama July, 1923, on the *Paparoa* en route for New Zealand. The *Paparoa* in the normal course of events was to make a call at Pitcairn to deposit mail, but a few hours before sighting the island a sudden tropical storm arose which prevented a landing and made it dangerous even to approach the island. Consequently the ship steamed on without stopping. Because at that time Pitcairn was out of the course of vessels bound for Panama, I deemed it unwise to attempt to reach Pitcairn by returning to reship at Panama. Instead, I continued on to Australia and sailed from Sydney in September, 1923, on the *Makambo,* for Norfolk Island, which lies about 1,000 miles northeast of Sydney. Until February, 1924, altogether about five months, I collected data on Norfolk. Unfortunately I was not able to make a second effort to reach Pitcairn.

I wish to express my thanks to Bernice P. Bishop Museum and to Dr. Herbert E. Gregory, the Director, for the opportunity to carry on the field work. I am indebted to many friends on Norfolk Island and above all to Uncle Cornish Quintal, whose kindly cooperation was always at my command. To Professor E. A. Hooton of Harvard University I am especially grateful. His initial interest and encouragement of this undertaking and his aid and guidance in the later stages have made this work possible.

HISTORY

In December, 1787, under orders from the British Admiralty, Lieutenant William Bligh, in command of *H. M. S. Bounty* of 215 tons burden, sailed from Deptford, England, for Tahiti. His mission, which was the result of petitions from the West Indian planters to George III, directed him to the south Pacific to collect breadfruit plants and to transport them to the West Indies. These plants were intended to serve as a cheap and perennial source of food for the plantation slaves. Ordered to proceed to the Pacific by the Cape Horn passage, Bligh was forced to make for the Cape of Good Hope after a month of persistent effort to round the tumultuous Cape Horn. Ten months after her departure from England, the *Bounty* reached Tahiti, at the end of October, 1788. Bligh's first concern was to establish friendly relations with the chiefs and the islanders by entertainment and the exchange of gifts. Having paved the way for the business of the expedition, the botanists set out to secure a sufficient number of breadfruit plants and other specimens of botanical interest which the *Bounty* had been especially equipped to carry.

All accounts relate the extreme cordiality soon established between the natives and the crew, who, after ten months of hard sea life, welcomed the abundant and soft hospitality of the Tahitians. Blight remarks that scarcely a man on the ship had not his *tyo* (friend).

Two episodes now occurred which have a significance in the light of later events. At four o'clock in the morning of January 5, 1789, a small cutter was missing, together with three men who later took part with Fletcher Christian in the mutiny. The desertion was unsuccessful. The men were punished by lashes and imprisonment. At daylight, February 6, the ship's cable was found severed, except for one strand. The gravity of the incident to the safety of the *Bounty* merited, in Bligh's mind, a strict search for the culprit, whom he believed to be one of the natives from a neighboring district. However, no one was found guilty, and in retrospect, Bligh came to believe that the act was committed by one of his own men, who, by driving the ship ashore, might prolong a pleasant stay at Tahiti. Sir John Barrow (2), one of the historians of the mutiny of the *Bounty*, considers the probabilities to have been that the cable, weakened by chafing on the rocky bottom, parted of itself.

By the 31st of March all the plants were on board. There were 774 pots, 39 tubs, and 24 boxes; the number of breadfruit plants was 1,015, besides specimens of other native flora. And on April 4, 1789, the *Bounty* sailed from Tahiti after long partings and final exchanges of gifts. Bligh's return voyage was directed toward Endeavor Strait and Java, where a brief stop was contemplated for additional plants. Thence his instructions were to proceed to the West Indies. The *Bounty* had arrived at Tonga and was standing to the north on the night of April 27th, passing between the islands of Tofoa and Kotoo. The watch had been divided into three parts: the master, Mr. Fryer, having the first; the gunner, the middle; and Fletcher Christian, the master's mate, the morning watch. Captain Bligh retired for the night with "his mind entirely free from any suspicion." But he was to awaken to a day which was to be the beginning of an adventurous story of romance on the high seas and of a series of crimes followed by idyllic calm and Arcadian simplicity. The famous mutiny took place April 28, 1789, which Captain Bligh (9) describes in the following extract:

> Just before sun-rising, Mr. Christian, with the Master-at-arms, gunner's mate, and Thomas Burket, seamen, came into my cabin while I was asleep, and seizing me, tied my hands with a cord behind my back, and threatened me with instant death, if I spoke or made the least noise. I, however, called so loud as to alarm everyone; but they had already secured the officers who were not of their party, by placing sentinels at their doors. There were three men at my cabin door, besides the four within; Christian had only a cutlass in his hand, the others had muskets and bayonets. I was hauled out of bed, and forced on deck in my shirt, suffering great pains from the tightness with which they had tied my hands. I demanded the reason for such violence, but received no other answer than threats of instant death, if I did not hold my tongue. Mr. Elphinston, the master's mate, was kept in his berth; Mr. Nelson, botanist, Mr. Peckover, gunner, Mr. Ledward, surgeon, and the master, were confined to their cabins; and also the clerk, Mr. Samuel, but he soon obtained leave to come on deck. The fore hatchway was guarded by sentinels; the boatswain and the carpenter were, however, allowed to come on deck, where they saw me standing abaft the mizen-mast, with my hands tied behind my back, under a guard, with Christian at their head.
>
> The boatswain was now ordered to hoist the launch out, with a threat, if he did not do it instantly, to take care of himself.
>
> The boat being out, Mr. Hayward and Mr. Hallet,

midshipmen, and Mr. Samuel, were ordered into it; upon which I demanded the cause of such an order, and endeavoured to persuade some one to a sense of duty; but it was to no effect:

"Hold your tongue, Sir, or you are dead this instant," was constantly repeated to me.

The master, by this time, had sent to be allowed to come on deck, which was permitted; but he was soon ordered back again to his cabin.

I continued my endeavours to turn the tide of affairs, when Christian changed the cutlass he had in his hand for a bayonet, that was brought to him, and holding me with a strong gripe by the cord that tied my hands, he with many oaths threatened to kill me immediately if I would not be quiet; the villains around me had their pieces cocked and bayonets fixed. Particular people were now called on to go into the boat, and were hurried over the side: whence I concluded that with these people I was to be set adrift.

I, therefore, made another effort to bring about a change, but with no other effect than to be threatened with having my brains blown out.

The boatswain and seamen, who were to go in the boat, were allowed to collect twine, canvas, lines, sails, cordage, an eight and twenty gallon cask of water, and the carpenter to take his tool chest. Mr. Samuel got 150 pounds of bread, with a small quantity of rum and wine. He also got a quadrant and a compass into the boat; but he was forbidden on pain of death, to touch either map, ephemeris, book of astronomical observations, sextant, time-keeper, or any other of my surveys or drawings.

The mutineers now hurried those they meant to get rid of into the boat. When most of them were in, Christian directed a dram to be served to each of his own crew. I now unhappily saw that nothing could be done to effect the recovery of the ship: there was no one to assist me, and every endeavour on my part was answered with threats of death.

The officers were called, and forced over the side into the boat, while I was kept apart from every one, abaft the mizen-mast; Christian, armed with a bayonet, holding me by the bandage that secured my hands. The guard round me had their pieces cocked, but, on my daring the ungrateful wretches to fire, they uncocked them.

Isaac Martin, one of the guards over me, I saw, had an inclination to assist me, and, as he fed me with a shaddock (my lips being quite parched with my endeavours to bring about a change), we explained our wishes to each other by our looks; but this being observed, Martin was instantly removed from me; his inclination then was to leave the ship, for which purpose he got into the boat; but with many threats they obliged him to return.

The armourer, Joseph Coleman, and the two carpenters, M'Intosh and Norman, were also kept contrary to their inclination and they begged of me, after I was astern in the boat, to remember that they declared that they had no hand in the transaction. Michael Byrne, I am told, likewise wanted to leave the ship.

It is of no moment for me to recount my endeavours to bring back the offenders to a sense of their duty: all I could do was by speaking to them in general; but my endeavours were of no avail, for I was kept securely bound, and no one but the guard was suffered to come near me.

To Mr. Samuel I am indebted for securing my journals and commission, with some material ship papers. Without these I had nothing to certify what I had done, and my honour and character might have been suspected, without my possessing a proper document to have defended them. All this he did with great resolution, though guarded and strictly watched. He attempted to save the time-keeper, and a box with all my surveys, drawings, and remarks for fifteen years past, which were very numerous; when he was hurried away, with "Damn your eyes, you are well off to get what you have."

It appeared to me, that Christian was some time in doubt whether he should keep the carpenter, or his mates; at length he determined on the latter, and the carpenter was ordered into the boat. He was permitted, but not without some opposition, to take his tool chest.

Much altercation took place between the mutinous crew during the whole business; some swore, "I'll be damned if he does not find his way home, if he gets anything with him," (meaning me); others, when the carpenter's chest was carrying away, "Damn my eyes, he will have a vessel built in a month." While others laughed at the helpless situation of the boat, being very deep, and so little room for those who were in her. As for Christian, he seemed meditating instant destruction on himself and everyone.

I asked for arms, but they laughed at me, and said I was well acquainted with the people where I was going, and therefore did not want them; four cutlasses, however, were thrown into the boat, after we were veered astern.

When the officers and men, with whom I was suffered to have no communication, were put into the boat, they only waited for me, and the master-at-arms informed Christian of it; who then said—"Come, Captain Bligh, your officers and men are now in the boat, and you must go with them; if you attempt to make the least resistance you will instantly be put to death;" and, without any further ceremony, holding me by the cord that tied my hands, with a tribe of armed ruffians about me, I was forced over the side, where they untied my hands. Being in the boat we were veered astern by a rope. A few pieces of pork were then thrown to us and some cloaths, also the cutlasses I have already mentioned; and it was now that the armourer and carpenters called out to me to remember that they had no hand in the transaction. After having undergone a great deal of ridicule, and been kept some time to make sport for these unfeeling wretches, we were at length cast adrift in the open ocean.

Notwithstanding the roughness with which I was treated, the remembrance of past kindnesses produced some signs of remorse in Christian. When they were forcing me out of the ship, I asked him, if this treatment was a proper return of the many instances he had received of my friendship. He appeared disturbed at my question, and answered, with much emotion, "That, Captain Bligh, that is the thing; I am in hell—I am in hell."

That the mutiny took place with such an unexpectedness as to find Bligh totally unprepared is evident from the sequence of events; that it was the result of a well planned conspiracy, which idea the captain came to believe, is very improbable. Bligh's deductions concerning the mutiny are extremely untenable: he first postulates a conspiracy to mutiny as he obviously cannot conceive a grievance against himself; he assigns the reason as being the appeal of Tahiti and its licentious life

to the rough sailors, who, unused to such an attractive existence, could not withstand its charms; then on the basis of a doubtful premise, he assumes a secrecy at which he marvels because 13 of his men who were cast adrift with him and who lived forward with the sailors were entirely unaware of any plans, and since the very messmates of Christian were also free of any suspicion of what was to take place. That Bligh is rationalizing is obvious and that he would attempt to place himself in the best light is human and to be expected. Yet Christian cannot be wholly condemned; from a certain viewpoint he acted under great provocation. A part of the blame for the mutiny must fall on the shoulders of Bligh. In spite of special qualifications as a seaman and a navigator, who had distinguished himself during his passage to Timor by ability and lofty courage and later with Admiral Nelson under fire during the Battle of Copenhagen (for which Nelson publicly thanked him), he nevertheless was possessed of an ungoverned temper. His personal relationship with his men was frequently strained. Bligh was the victim of a second mutiny in New South Wales during his regime as governor of that colony. From Morrison's journal (64) it appears that Bligh on several occasions was not only hasty in abuse, but unjust.

Thus, Bligh with 18 of the crew was set adrift in the ship's launch hastily provisioned with 150 pounds of bread, 32 pounds of pork, 6 quarts of rum, 6 bottles of wine, and 28 gallons of water. So heavily laden was the launch that its gunwales were only a few inches from the water. With the superb confidence of the hardened sailor, Bligh determined to make for the East Indies, some 3,000 miles away, over a sea practically unknown. For 41 days, facing the prospect of starvation, suffering from the heat and thirst, and fighting the elements, Bligh and his men continued slowly toward their objective. Great was their joy when at 3 o'clock in the morning of June twelfth, Timor was sighted. Two days later they landed at Coupang and were very kindly received. That Bligh had reached his destination after traveling 3,618 nautical miles was a feat that remains unsurpassed even to this day. As an example of seamanship in negotiating the treacherous Great Barrier Reef and Torres Strait, Bligh is deserving of the highest praise. In March of the next year, Bligh and those who survived the trip to Timor sailed for England. Of the original 19 who were cast adrift by the mutineers, only 12 reached England.

On the other hand, Christian, after disposing of Bligh, made for the island of "Toobouai" [Tubuai], where it was his intention to set up a colony. Because of the hostility of the natives and in order to secure supplies, he abandoned Tubuai temporarily to continue on to Tahiti. After stocking up at Tahiti, the *Bounty* once more returned to Tubuai and a permanent settlement was established. Friction between the natives and the sailors soon broke out, and, eventually, caused Christian definitely to abandon the hope of a colony on that island. After returning once more to Tahiti, internal rupture in the crew made it apparent to Christian that a division of the men was necessary. Those who preferred to remain at Tahiti were put ashore, while 9 of the original 25 mutineers decided on the idea of a retreat where they might be safe from a punitive expedition from England.

The 16 mutineers who remained at Tahiti were unmolested until March, 1791, when Captain Edwards of *H. M. S. Pandora* arrived with orders to capture the mutineers for trial in England. With the exception of two who had perished in the interim, all the mutineers at Tahiti were imprisoned on the *Pandora* in the shocking and infamous pen known as "Pandora's Box." Unable to locate the other 9 mutineers, who had sailed in the *Bounty*, Edwards left for England with his prisoners. After suffering a shipwreck on the Great Barrier Reef and undergoing great hardship, they finally arrived in England in June of 1792. The 10 surviving prisoners were tried, but only 4 were hung.

Christian had with him the following men when he left Tahiti: John Mills, Edward Young, William Brown, Isaac Martin, William McCoy, John Williams, Matthew Quintal, Alexander Smith, later known as John Adams. The number of natives who accompanied Christian varies in different accounts. Bligh (56), in the log of his second voyage to Tahiti, enumerates 10 men, 2 boys, 9 women, and 1 girl. Barrow (2) states that besides the white men there were 7 Tahitian men and 12 women. Edwards (32), however, declares that he was unable to find out the exact number of natives that Christian took with him, although Christian took care to have more women than white men, as the scarcity of women had previously been a cause for strife. Young (92), writing in 1894, says there were 6 native men, 10

women, and a girl of fifteen. Miss Young, a descendant of the mutineers, evidently based her figures on tradition. Brodie (15), also dependent on tradition, gives the native tally as 6 Tahitian men, 12 women, and a baby girl. That Christian intended to find a deserted island and make a permanent settlement was well known by all the mutineers including those who preferred to remain at Tahiti. It was reported to Captain Edwards upon his arrival that Christian had frequently declared his intention of landing on a harborless island which would be his protection against an invasion of his retreat. It seems doubtful that Christian knew of Pitcairn before his departure, for the mutineers captured by Edwards never betrayed any knowledge of Christian's deserted island.

Pitcairn Island is situated in latitude 25° 5′ S., longitude 130° 5′ W., which is approximately on the southern limit of the tropics. It is about 1,200 miles from Tahiti and more than twice that distance to the South American coast. The nearest land is Henderson (Elizabeth) Island, a low sandy waste, about 120 miles distant. At the time of the mutiny, Pitcairn was uninhabited, although evidence of a previous people was found later by Brodie (15, p. 47) and Murray (65, pp. 109, 110). Pictographs, stone implements, and human bones discovered in after years by the descendants of the mutineers attest to the fact that a branch of the Polynesian people had visited and probably dwelt for some time on the island. It has even been suggested by Louis Becke that one of the Tahitians who accompanied Christian was aware of the island and directed him there.

Pitcairn is volcanic, rising abruptly from the sea, and girded by precipitous cliffs which make landing hazardous and in rough weather distinctly perilous. Murray states that the island is 4½ miles in circumference with the greatest length only 1½ miles. The climate is very equable, the averages of the season ranging from 65° to 82°. The flora is typical of the Polynesian islands, including most of the food plants, while animal life consists of lizards and rats. Insects and birds, however, abound, the insects almost constituting a pest. On the whole the natural advantages of Pitcairn are many and afforded the mutineers an admirable retreat and luxuriant home. There is no record of the emotions aroused in Christian at the first sight of what was to be his home for the next few years, and where he was to die, as some reports have it, a violent death.

On his arrival at Pitcairn, Christian, after landing the ship's stores, ran the *Bounty* on the rocks and burned her to prevent desertion. The island was then divided into nine parts, one for each of the white men. The history of the island is not clear for the next ten years. There are several slightly varying accounts, but they all agree in their descriptions of the carnival of murder and carnage which broke out some time after the landing. Not only were the white men quarreling among themselves, but the Tahitians sought revenge against the mutineers, who, in a high-handed manner, took their wives and treated them as slaves. At any rate, after a series of murders, five of the mutineers were killed and all the native men, leaving only Quintal, McCoy, Young, and Adams (Smith). McCoy killed himself in a drunken debauch and Quintal was murdered by the others in self-protection. Soon afterward Young died of asthma, leaving John Adams the only man, with the native women and the children of the various unions of the sailors with the Tahitian women.

All accounts agree that from that day was the beginning of a new era. Adams related that as the result of several dreams, which he took to be indications of the Divine will, he reformed his ways and attempted to inculcate into the young brood of children the principles of a Christian life and something of an education as far as his limited learning would permit.

Until 1808, the colony was completely lost sight of by the world. In that year a Boston captain, Folger, came upon the island and reported the existence of the colony to the British admiralty. Mayhew Folger was followed in 1814 by Captains Staines and Pipon of *H. M. S. Briton* and *Tagus*. Although they were aware of Folger's discovery, they seemed to have doubted the existence of the colony. Their surprise and delight have been recorded by Shillibeer (80). The peaceful monotony of the islanders continued unbroken until 1823 when the *Cyprus* of London, J. Hall in command, stopped at Pitcairn. On board was an Englishman by the name of John Buffet who conceived a strong desire to remain and live on the island. He was granted permission by the captain and welcomed by the Pitcairn Islanders. A shipmate, John Evans, stayed behind with him, traditionally having jumped ship. Buffet was born near Bristol, England, while Evans was the son of a coachmaker in Long Acre.

In 1826 another permanent addition to the

population of the island was made in the person of George Hunn Nobbs. The fame of the ideal simplicity of the Pitcairn colony had reached Nobbs, who became filled with the desire to settle on the island. After many vicissitudes, he, together with Noah Bunker, an American, sailed in a bark of 18 tons burden from Callao. Bunker died soon after the landing at Pitcairn, but Nobbs married one of the island girls and remained as teacher, physician, and later pastor. Nobbs, who was said to be the illegitimate son of a British peer, had a good education and soon after the death of Adams, in 1829, assumed the leadership of the island. In 1831, the colony moved to Tahiti, because Pitcairn was becoming cramped under the constant increase in population. A few months sufficed to persuade the islanders that they preferred Pitcairn and they consequently returned, having lost many of their numbers through disease contracted at Tahiti. From then on, ships stopped with increasing frequency at Pitcairn and very soon the fame of this harmonious group spread throughout Europe and America and was the text of many Victorian sermons and Sunday school tracts on the efficacy of the Christian life on an unregenerate group.

The colony grew with amazing rapidity and in 1856, after petitioning the British Government, the entire colony of 187 individuals was removed on the *Morayshire* to Norfolk Island, which, in the previous year, had been given up as a penal colony.

Norfolk Island, which the Pitcairn Islanders had determined upon as their future home, is situated roughly in latitude 29° S. and longitude 167° 50′ E. It is a volcanic island about 20 miles in circumference, 5 to 6 miles at its greatest breadth, and contains upwards of 8,000 acres. The highest point, Mount Pitt, has an altitude of about 1,000 feet. The greater part of the island is a plateau pierced by numerous gullies. There is evidence of several geological levels, indicating a series of elevations. The soil is very rich, bearing a wide variety of tropical and subtropical fruits. Upon their arrival, the descendants of the mutineers found bananas, coconuts, plantains, pineapples, oranges, grapes, guavas, and a great many more edible fruits and plants. Fish are abundant along the shores. There was enough land to remove all anxiety of over-population.

Norfolk Island was discovered by Captain Cook in 1773, and was in 1788 taken from New South Wales and became a dependency of Great Britain. Under the British Government it became a penal colony. Now it is under the dominion of the government of Australia. On the point of abandoning the island as a penal colony, the government favorably entertained the petition of the Pitcairn Islanders and in 1855 the convicts were removed. All the government buildings were allowed to remain; these consisted of compounds for the prisoners, a government house, two churches, and various small cottages, which served as quarters for the officers and barracks for the soldiers. Most of the structures were of gray stone and the larger ones of an austere Georgian architectural type. Livestock left for the benefit of the newcomers consisted of cattle, sheep, and horses.

A few hundred yards to the south of the island is Nepean, a small islet, and about five miles southward is Philips Island, a barren pile with chameleon-like coloring. New Zealand is 600 miles and Australia 900 miles distant.

The first sight of Norfolk was a disappointment to the newcomers. They missed the rugged beauty of Pitcairn. The park-like tranquility of an English countryside that they found at Norfolk seemed tame after the wild luxuriance of their former home. It was like a new world—the three-storied buildings of the former penal settlement, the oxen, and horses. But the newness soon wore off and most of the islanders adapted themselves to the new conditions. However, at the end of 1858, two of the families decided to return to Pitcairn much against the wishes of Nobbs and of their relatives. Five years later another group of 27 left for Pitcairn. These were the last to break away from the main community on Norfolk. The succeeding history of both these colonies has been calm and uneventful. Norfolk has increasingly in recent years attracted outsiders, some of whom have settled and married descendants of the mutineers.

LIFE AND CUSTOMS OF THE PITCAIRN ISLANDERS

INTRODUCTORY STATEMENT

The mutineers and their Tahitian wives brought with them to Pitcairn no idealistic theory for the foundation of a new society. An account of their life and customs is the story of the development and growth of an unconscious social experiment. It is interesting to note the survival of Tahitian customs and methods peculiarly adapted to the environment of Pitcairn, and the change brought about by the introduction of American and European ideas and manufactures. But even more interesting are the customs developed by the islanders themselves, especially their self-government and their social and religious attitude. That the Pitcairn Islanders were isolated from all contact during the very early years of the colony is a matter of great importance. There are few half-caste groups who have no sense of social inferiority due to the stigma attached to half-breeds. At Pitcairn the progeny of two distinct stocks grew up without any of the degrading influences which surround the mulattoes of America and the Eurasians of India.

Because of the nature of the history of the gradually changing customs of the Pitcairn and later the Norfolk Islanders, it is not possible to isolate a single period for description without giving a false impression. As a result of my attempt to describe not only fully, but historically, the conditions as they were in the beginning and their later changes both on Pitcairn and Norfolk, the ensuing account may be slightly difficult to follow, but it must be remembered that two pictures are to be carried at the same time—one of the Pitcairn Islanders, the other of the Norfolk Islanders since the removal from Pitcairn.

VILLAGES AND HOUSES

Upon landing at Pitcairn Island, the mutineers built the village now known as Adamstown. It is situated about 100 yards from the landing place at Bounty Bay and is approached by a path which ascends a sharp cliff. Between the village and the sea a row of trees was left standing to conceal the settlement from possible pursuers. The houses were arranged around an oblong plot of ground, or common, after the fashion of English villages. Within this common, protected by a fence from goats and hogs, chickens were turned loose. On the outskirts of the settlement the plantations were grouped with neatness and order. Beechey (6) reports that there were only five houses in 1825, but the number soon increased. Every cottage had its own outhouse for making cloth, its baking place, sty, and poultry house, and was embowered in trees and creepers which excited the admiration of visitors. A few cottages were scattered about the island, but most of the inhabitants dwelt in the village itself. From the village several pathways led to various parts of the island and to those farms which were distant from the settlement.

Captain Wood (89) gives the following description of the houses on Pitcairn as seen in 1850.

> I paid visits with Mr. Nobbs to all the families in their houses. They are all lodged alike; the houses are built of wood, and show progressive improvement in the mechanical part of them, which would not disgrace an European tradesman. They consist of one long room, divided by two or more partitions, and are raised upon huge sleepers placed upon large stones, to clear them some two or two and a half feet from the ground. They all lie nearly east and west, with the door fronting the north, and the same front contains windows, forming nearly the whole side of the house, and closed by sliding shutters; their roofs have a moderately high pitch, and are formed of the pandanis leaf, which being bent over a long light stick, forms a kind of a board. Several of these laid nearly close form an excellent thatch, lasting from five to seven years. The side opposite the windows is occupied by the bedplaces, which are similar to the sleeping berths in the old packets. These have again a smaller window, or scuttle, as a sailor would call it, which admits air when they are shut out from the common room or hall by drawing the curtains.

Brodie (15) states:

> The dwelling houses are from forty to fifty feet long, about thirteen feet high, and fifteen feet wide. There is no glass upon the island, except one small window, which came out of the *Bounty*, and which is in Mr. Nobbs's house. The windows, more like portholes of a ship, go all round the houses, and are closed in bad weather with sliding shutters. One end of the house, about ten feet long, is portioned off, as the sleeping apartment for the head of the family and his wife. Sometimes the other end is likewise cut off; when this is the case, it is generally occupied by one of the married children and family, who often still reside with the old people some time.

The upper story of some of the houses is described by Beechey (6, p. 79).

> The greater part have an upper story, which is appropriated to sleeping, and contain four beds built in the angles of the room. . . . The floor is elevated about a

foot from the ground, and, as well as the sides of the house, is made of stout plank, and not of bamboo, or stone, as stated by Captain Folger; indeed they have not a piece of bamboo on the island; nor have they any mats. The floor is a fixture, but the side boards are let into a groove in the supporters and can be removed at pleasure, according to the state of the weather, and the whole side may, if required, be laid open. The lower room communicates with the upper by a stout ladder in the center, and leads up through a trap door into the bedroom.

Wood (89) says that the houses were built of *aruni* or *mero* wood, which was remarkably sound, some of it having lasted more than fifty years. Except for the Nobbs house and the schoolhouse, paint or whitewash was not used in the early days of the colony, although now it is applied to some extent. The *toonena,* a forest tree which grows 9 to 12 feet in circumference and which produces a heavy, red-colored lumber, was also used extensively for building until it became very scarce. Although the house itself was designed by the mutineers and was unlike a Tahitian dwelling, the method of thatching was clearly derived from Tahiti where, according to Ellis (34, vol. 1, p. 385), lauhala (leaves of *Pandanus*) was used. There are no detailed descriptions of the technique of thatching as applied on Pitcairn Island but Beechey (6, p. 78) states that the lauhala was bent around a stem and laced horizontally to the rafters.

The Island Register (65, p. 267) speaks of the schoolhouse built in 1846 as "a very decent building and reflects much credit on the persons engaged in the construction of it." (See p. 26.)

On Norfolk Island, most of the houses built by the descendants of the mutineers are one-story dwellings, which resemble bungalows. The planks are set on end instead of horizontally, an unusual feature which seems to be a survival of the Pitcairn method of construction. The wood on Norfolk, though abundant, is soft and easily destroyed by wood borers. To meet this difficulty, the Norfolk Islanders have developed a method of protection which, so far as I know, is unique. The newly completed house is given successive coats of paint and on each coat fine beach sand is sprayed while the paint is still wet, thus producing a durable, protective covering which has the pleasing appearance of stucco. The roof is commonly of corrugated iron. Some of the old stone houses erected on Norfolk during the occupation of the island as a penal colony are still in use. Unlike Pitcairn, Norfolk Island has no real village. The old settlement of Kingston contains but a few families; most of the inhabitants live in houses scattered over the entire island.

FURNITURE

The interiors of Pitcairn Island houses were very simple and contained plain and solid homemade furniture. The lower floor served generally as a combined dining room, living room, and bedroom. The main bedroom, however, was on the upper floor and reached by a ladder through a trapdoor. A bed raised about 18 inches from the floor, stood in each of its four corners. These beds, according to Beechey, were made from the "cloth tree" and were large enough to accommodate four people with comfort. The mattress was made of palm leaves and was covered by three layers of tapa, an excellent substitute for linen. Fortescue Moresby, after a visit in 1854, speaks of sleeping in a feather bed, which doubtless was a luxury unknown in the early days of the settlement. There were no screens or curtains in the upper story of the house. Air and light were admitted through glassless windows, provided with sliding shutters which might be closed during bad weather.

In the main room on the lower floor, one or two beds were placed against the wall opposite the entrance. Brodie says that the wall opposite the door was fitted up with sleeping berths, raised about 3 feet from the floor. Besides the beds, or berths, this room contained a large table and several stools. Chests were used for clothing and tapa. There were no mats or rugs on the floors nor curtains on the windows. No mats appear to have been made by the Tahitian women. The furniture used was made entirely by the islanders until articles of foreign make were imported. Unfortunately there are no detailed descriptions of this primitive furniture but it certainly did not follow Tahitian models.

The lighting arrangements were primitive. Beechey (6, p. 75) describes the conditions which prevailed in 1825:

Three or four torches made with doodoe nuts (*Aleurites triloba*) strung upon the fibres of the palm leaf, were stuck in tin pots at the end of the table, and formed an excellent substitute for candles, except that they gave considerable heat, and cracked, and fired, somewhat to the discomfort of the person whose face was near them.

Ellis (34) states that the Society Islanders also used the candle-nut strung on the stiff stalks of leaves for lighting their houses.

The houses contained no heating system, as the climate is very mild and all the cooking was done in an outhouse.

The bare simplicity of the early Pitcairn houses was to some extent relieved by prints and looking-glasses, after trading contact with the whalers had been established. "One had an American clock," writes Wood (89, p. 208), "which, however, would not go, nor did its owner care whether it went or not; 'The sun,' he said, 'was the best timepiece'." Oil lamps were later substituted for the candle-nut.

The present day Norfolk Islanders use furniture of foreign manufacture and decorate the walls with lithographs and cheap prints. Their homes resemble those of Englishmen and Australians of the same economic status. Modern plumbing and lighting are lacking, but many homes have upholstered furniture, and some even have pianos of an antique type. The only articles of furniture made at the present time are such things as benches and tables for rough use.

DRESS

As material for clothing, the mutineers at first manufactured tapa in the Tahitian manner. Shillibeer (80) says that Thursday October Christian, the son of Fletcher Christian, was garbed only in a loin cloth (*mara*) and a straw hat with black cock's feathers. A mantle reaching to the knees and a *mara,* both made of tapa, was a complete costume for men. Their legs and feet were bare. As usual in Polynesia, the *mara* was passed over the hips, between the legs, and then knotted behind. Some of the men wore straw hats with low crowns and flowing ribbons, similar to those worn by the English sailors of that period and probably by the mutineers themselves.

Speaking of the men in the Society Islands, Ellis (34, vol. 1, p. 157; vol. 2, p. 125) remarks:

> Their dress was generally a *pareu* around the waist and a native *tiaputa* over their shoulders, which covered the upper part of the body, excepting the arms. Over the shoulders, when not at work, they wore a loose *ahu buu,* a kind of scarf or mantle, in some degree resembling the Roman toga; or they appeared in the *tiaputa,* an article of dress having an aperture in the center through which the head is passed, the other parts extending over the shoulders, breast, and back. The *tiaputa* was generally worn by the chiefs and all persons of respectability.

That European clothes had been obtained by the Pitcairn Islanders before 1825 is shown by the remark of Beechey:

> Their dress, made up of the presents which had been given them by the masters and seamen of merchant ships, was a perfect caricature. Some had on long coats without any other article of dress except trousers, some, shirts without coats, and others waistcoats without either; none had shoes or stockings, and only two possessed hats, neither of which seemed likely to hang long together.

Waldegrave (88) found that in 1830 some of the men wore the *mara* although others were clothed in jackets and trousers, and that shoes were practically unknown because of the difficulty of obtaining them. Both Brodie (15) and Young (91) say that the men wore trousers cut short above the knee, and Brodie adds that shorts and a cap or a hat completed their costume, and that at the time of his visit (1850), shoes and stockings and other European clothes obtained from whalers were worn on Sundays. As contact with the outside world increased, the dress of the islanders changed to conform with European fashions.

The clothes worn by the women, like those worn by the men, were at first entirely derived from Tahitian sources. The sail cloth from the *Bounty* was utilized, but the principal dress material was tapa. Beechey (6, pp. 73-77) states:

> They almost all wore the cloth of the island. Their dress consisted of a petticoat, and a mantle loosely thrown over the shoulders, and reaching to the ankles . . . hair, which hung down over their shoulders in long waving tresses, nicely oiled; in front it was tastefully turned back from the forehead and temples and was retained in that position by a chaplet of small red or white aromatic blossoms, newly gathered from the flower tree (*Morinda citrifolia*) or from the tobacco plant. . . . It must be remembered, that with these people, as with other islanders of the South Seas, the custom has generally been to go naked, the *maro* with the men excepted, and with the women, the petticoat, or kilt, with a loose covering over the bust, which, indeed in Pitcairn's Island, they are always careful to conceal; consequently, an exposure to that extent carried with it no feeling whatever of indelicacy; or, I may safely add, that the Pitcairners would have been the last persons to incur the charge.

The petticoat worn by the women consisted of a single piece of tapa usually about a yard wide and two yards long which was placed around the waist and fastened securely by twisting the ends and tucking them in. The tapa was colored yellow, red, or brown, with vegetable dyes. The hair was braided and tied in a knot at the back of the head without pins or combs. This method of wearing the hair was said to be of advantage when working in the fields or carrying a load of yams on their heads. Most of the women wore

hats made from palm leaves and grasses. Pipon (74) exclaims with delight that the simplicity and good taste of these hats would please a fashionable London dressmaker. On Sundays the Pitcairn women wore, over the petticoat described above, a loose gown reaching to the ankles and gathered at the neck.

That the women of Pitcairn Island modeled their costumes after those worn by their mothers in the Society Islands is shown in the description by Ellis (34, vol. 1, p. 158):

> The appearance of the females [in Tahiti] was equally interesting; the greater part of them wore a neat and tasteful bonnet, and made with the rich yellow-tinted cocoanut leaf. Their countenances were open and lively. Many of them had inserted a small bunch of the fragrant and delicately white gardenia, or Cape jessamine flowers, in their hair; . . . . Their dress was remarkably modest and becoming, being generally what they term *ahu bu,* which consists of large quantities of beautifully white native cloth, wound around the body, then passed under one arm, and fastened on the other shoulder, leaving uncovered only the neck and face and part of one arm.

As time went on, the dress of the women gradually changed. Later visitors describe many variants of the simpler and earlier costume. By 1850 the primitive petticoat and mantle had entirely disappeared and was replaced by whatever was available among the gifts of clothing brought to the island by the wives of the captains of American whaling ships. It is curious to note the special attention which was given to Sunday dress.

Brodie mentions that the unmarried girls wore a wreath of flowers around the head as a sign of their single state, but it is probable that this custom was merely youthful love of self adornment. It is stated by Beechey that the children were allowed to run about in a state of nature until they were two or three years old.

On Norfolk Island the descendants of the mutineers wear European clothes exclusively. The younger members of the community follow as closely as they can the latest modes from Australia. Many of the older women wear a black skirt and waist for their best. When working, the men wear heavy cotton trousers and shirt, often with no shoes. The women wear a loose gown and are also shoeless, especially when indoors.

NAVIGATION AND BOATS

After landing at Pitcairn, the mutineers took care to destroy the *Bounty* to prevent any member of the colony from deserting. For a time the colonists were without means of navigation, boats not being built until later. Mayhew Folger, who discovered the colony in 1809, observed a boat being paddled toward him, and Barrow (2), describing Captain Pipon's visit in 1814, writes:

> Presently they observed a few natives coming down a steep descent with their canoes on their shoulders; and in a few moments perceived one of these little vessels darting through a heavy surf and paddling off toward the ship.

Young (91) records the demand of the women that a conveyance be built to take them from the island, and that the discontent of the women increased until the men were forced to comply with their wishes. On April 14, 1794, the men began to build a boat; but wanting planks and nails, Jenny, one of the Tahitian women, in her zeal, tore up the boards of her house and endeavored without success to persuade some of the others to follow her example. On August 13 the vessel was finished and on August 15 was launched. Beechey writes of the boat:

> As Young says, according to expectation she upset, and it was most fortunate for them that she did so; for had they launched out upon the ocean, where could they have gone? or what could a few ignorant women have done by themselves, drifting upon the waves, but ultimately have fallen a sacrifice to their folly? However, the fate of the vessel was a great disappointment, and they continued much dissatisfied with their condition.

On May 4, 1795, two canoes for fishing were begun and in two days completed. These canoes must have been light and flimsy, as they were easily portable.

It is of interest to inquire whether or not the first canoes built at Pitcairn were of the Polynesian dugout or outrigger type. As their construction was in the hands of Englishmen, it might be expected that English models would be followed. On the other hand, their six months sojourn on Tahiti may have convinced the Englishmen of the serviceability of the Polynesian canoe. The only description of these canoes is the statement of Folger (36) quoted in the Quarterly Review (75): "On approaching the shore, I was met by three young men in a double canoe." On such scanty evidence it is unsafe to state that an outrigger or other Polynesian type of canoe was present on Pitcairn.

Soon after the visit of Staines and Pipon in 1814, whaleboats were obtained from passing ships, and although these were useful for general

purposes, the canoe remained the favorite fishing vessel. According to Brodie, it was the custom of the islanders on the approach of an ordinary whaler to go off to her in one of the canoes, but when a British man-of-war appeared, the whaleboat was launched to show their respect for the British Navy, which they looked upon as their navy. The whaleboats were used also for carrying timber and other articles from one side of the island to the other and for carrying passengers to and from ships. The whaleboats as well as the canoes were housed in three boathouses built near the landing. At the time of Brodie's visit (1850), these boathouses contained three whaleboats, two of which had been presented in 1848 by Captain Worth as a present from the British Government, the other purchased from a whaling vessel. The houses contained also several of the twenty canoes owned by the colonists. The Pitcairn Island canoe held two persons, was light enough to be carried easily by one man, and was made to last about five years by frequent repainting. Beechey states that the seams were caulked with resin extracted from the banyan tree.

The islanders developed a system of signals with flags, by which they communicated with approaching vessels, and a customary courtesy of the islanders on coming alongside a vessel was to ask permission before they attempted to board the ship.

All visitors to Pitcairn write with admiration of the skill of the islanders in navigation and in making the difficult landing in Bounty Bay, which Captain Freemantle (37) describes as "particularly hazardous; it being rarely that a ship's boat ought to land. The natives are very clever with their canoes and will land in almost any weather." Belcher (7, pp. 203-04) quotes Captain Wood's description of the whaleboats which came off to met him in 1849:

> . . . but a stout strapping fellow, John Adams, was pilot for the time: this berth they take in rotation, each family according to their seniority, and that family has the privilege of entertaining the captain when on shore . . . and accompanied by Buffet and some of my officers, pulled in toward the landing place, which is in a small cove called "Bounty Bay." The wind was fresh and the swell high, so that it seemed to me when I got to the spot that I was more likely to go on shore out of the boat than in it; but as both the whaleboats had just passed in safely I determined to try it, and in two trips we were all safely deposited on the beach. The way they affect a landing is this—one whose experience can be trusted mounts a rock that commands a view of the sea, and watches for the proper moment, when at a signal from him, the boat, which has been lying as close to the breakers as possible, makes a rush, and, by taking one of the less heavy breakers, goes flying in before it, frequently without a stroke of the oars being necessary except to steer her, till we get within the rocks, when all danger is over; but as this turn is very narrow and sharp, it requires skill and experience to get a boat in safely, for a trifling deviation on either side would dash the boat to pieces on the rocks.

Writing in 1854, Fortescue Moresby (63) states: "The sea was now pretty high and on one trip the boat was turned over."

Good seamanship was a necessity in such dangerous waters, but Adams undoubtedly had a part in training the young men. Buffet, who settled on Pitcairn in 1823, taught the younger and more eager of the men some of the principles of navigation and of the more advanced branches of arithmetic, but such knowledge was of little practical use for the short trips made by the islanders.

At Norfolk Island canoes are no longer used. Whaleboats are the only means of navigation and are used for fishing, whaling, and for carrying passengers and goods to and from visiting vessels. In chasing whales, sails are used. The landing on Norfolk in rough weather is by no means easy, but the boats are handled with a great deal of skill and guided through the breakers so accurately as to come exactly at the landing. A good index of the seamanship of the Norfolk Islanders is their success in whaling. Contact with American whalers was extensive during the middle and latter part of the 19th century, and some of the islanders shipped with the whalers on long cruises during which they became adept in hunting whales. The technique employed is that of the New England whalers. The position of the harpooner, the boat-steerer, and the crew conform to New Bedford standards. Even the gear is reminiscent of the older days of this maritime industry: the harpoons, spears, the tub, and coiled line are carefully laid to run easily.

During the whaling season on Norfolk Island, which lasts from July to October, each of the three crews organized for whaling goes out daily except in bad weather. Their field of operation is in general limited to a ten-mile radius from the island. During an ordinary season from four to six whales are killed. This may seem a small catch but the whales are not plentiful and can be caught only when they approach the island.

IMPLEMENTS AND UTENSILS

The implements and utensils of the mutineers and their descendants were derived from four

sources. Unquestionably many articles were taken from the *Bounty* before she was destroyed. The Tahitian women brought with them some domestic utensils. Several pounders which traditionally came from the Society Islands were preserved on Norfolk Island. I have in my possession a pounder of characteristic Society Island type, which is said to be the last stone pounder on Norfolk Island. It was inherited by Mrs. Norah Christian from her grandmother, Mrs. G. H. Nobbs, who was the granddaughter of Fletcher Christian, and had been used in the early days of the colony. Most of the implements in use immediately after the settlement on Pitcairn, and before extensive contact was established with the passing vessels, were of home manufacture. As trading increased, and the interest of sympathizers in England and America grew, articles of European and American manufacture became more common, until at the present time on Norfolk Island practically all domestic utensils and implements are of foreign make

Shillibeer (80) speaks of fishing hooks and needles which were beaten out of old iron hoops. Staines and Pipon (81) in 1814 presented the islanders with gifts of kettles, tools, and other articles.

Beechey relates that in 1825, he sat down at table at young Christian's house where he found plates, knives, and forks. It is not known whether this was the only set on the island and brought out in honor of the Captain's visit, or whether by that time the tableware had been obtained by trade with the whalers.

A description of the life on Pitcairn published in 1814 (75) states that the agricultural implements were made of iron obtained from the *Bounty* and beat out into spades, hatchets, and crowbars.

Beechey (6, pp. 74-75) expresses his surprise at finding china and cutlery on Pitcairn as early as 1825:

> . . . but at Christian's I found a table spread with plates, knives and forks, which, in so remote a part of the world, was an unexpected sight. They were, it is true, far from uniform, but by one article being appropriated for another, we all found something to put our portion upon, and but few of the natives were obliged to substitute their fingers for articles which are indispensable to the comfort of more polished life.

Beechey mentions also the wide use of calabashes for carrying water, a Polynesian custom which was probably introduced by the Tahitian women. Another Tahitian utensil is the tapa beater, regarding which Beechey states that some of the women preferred a close-ribbed, and others a wide-ribbed beater.

The account of Wood (89, pp. 207-208) shows that conditions had much improved during the 24 years following the visit of Beechey.

> They had once two donkeys to do this work [carrying yams], but they did not answer, and now the only conveyance they possess is a kind of wheelbarrow . . . I visited the Bounty's forge, which is still in being, with the exception of the bellows, which has long since gone to pieces; the anvil has lost its nose. This with a large copper fish-kettle are the only considerable remains of the *Bounty* that I saw, but I got pieces of her copper, wood, etc., of which they all possess a portion . . . knives and forks were, as well as spoons and tumblers, not wanting at the table, which was covered with clean cloth, and dishes and plates seemed by no means scarce. This was a great improvement over Beechey's time when but three of the latter conveniences were to be found.

Brodie, in 1850, found that the colonists needed many utensils and implements, and that the articles of domestic use which they did possess were used by necessity for a great many purposes. With the coming of the American whalers it was possible for the islanders to procure by trade many tools and implements, and the necessity for home manufacturing decreased and finally disappeared.

On Norfolk Island practically all tools, agricultural equipment, and household utensils are of foreign manufacture.

FISHING AND HUNTING

Fishing on Pitcairn was not only a form of sport but also a valuable means of procuring food. Beechey relates that shortly after arriving at Pitcairn the mutineers built light canoes which they used for fishing and that the men, accompanied by the women, went fishing when the crops did not require attention. Murray states that each family had fish once, or even twice, a week, and quotes Nobbs in a letter as writing that the men generally went out fishing in canoes on Saturday. Shillibeer says that the first fishing hooks were made from old iron hoops obtained from the *Bounty*. These were displaced by hooks received from passing vessels but according to Shillibeer and to Beechey, homemade fishing lines were preferred. Brodie remarks that their own lines were made from sail twine, as these homemade lines were not so likely to twist in deep water as were the foreign made ones.

The earlier visitors to Pitcairn mention plentiful fish but Brodie found fish scarce in 1850. Most of the fishing was done in water from 100 to 200 fathoms deep and one or two miles from shore. Cod, gray mullet, and red snapper were the common varieties obtained. Some smaller fish were caught among the rocks, usually by the women, who captured also squids washed up by the surf, a dangerous sport which required agility to avoid the force of the tremendous waves. Crawfish were obtained among the rocks a few feet below the surface. A favorite method of fishing was to go out at night with a light to attract the fish which were then speared by a pole about 20 feet long armed with five barbed prongs.

So far as I have been able to ascertain, the Tahitian fishnet was not used on Pitcairn Island and the rocky and precipitous shore of Pitcairn made it impracticable to use the Tahitian method of building a stone enclosure for entrapping fish. Spearing and torch fishing were methods common to Pitcairn and Society Islands. I find no mention of whaling on Pitcairn but it is known that some of the islanders joined the crews of American whaling ships.

Another favorite form of recreation was hunting goats, wild hogs, fowls, and wild birds. Beechey writes that the mutineers were fond of hunting and that the successful hunter shared with the others and was repaid at leisure. Moresby (63) marveled at the nimbleness of the hunters.

> We also got a good idea of the risk the men run while hunting goats. It is wonderful how they can cling on, for to our weak heads it appeared a feat to stand on the edge and look down. I said to one "you cannot go down there"; he immediately clung to the side and in a moment was six or eight feet down—proof that he could accomplish the remaining 300 feet.

It appears from Young's journal (91) that the mutineers also trapped birds and built pits for hogs. There is, however, no record that their descendants used the snare or trap and it is probable that the device was adopted as a means of conserving ammunition.

On Norfolk Island the game consists of pheasant, snipe, quail, wild pigeon, and jack snipe. Fish are fairly abundant and include the following kinds: mackerel, trumpeter, garfish, schnapper, trevalla, mullet, king fish, and various varieties of small fish. Whaling is a seasonal occupation. (See p. 13.) Both men and women engage in fishing. The women usually cast their lines from the rocks along the shore and but rarely accompany the men to the deeper waters. The Norfolk Island methods of fishing are not distinctive.

AMUSEMENT AND MUSIC

Many of the early visitors to Pitcairn Island mention the strict religious observances and dislike of levity. Beechey (6, pp. 81ff.) observes:

> The dance is a recreation rarely indulged in, but as we particularly requested it, they would not refuse to gratify us. A large room in Quintal's house was prepared for the occasion and the company were ranged on one side of the apartment, glowing beneath a blazing string of doodoe nuts; the musicians were on the other, under the direction of Arthur Quintal. He was seated upon the ground, as head musician, and had before him a large gourd, and a piece of musical wood (*porou*), which he balanced nicely upon his toes, that there might be the less interruption of its vibrations. He struck the instrument alternately with two sticks, and was accompanied by Dolly, who performed very skillfully with both hands upon the gourd, which had a longitudinal hole cut in one end of it; rapidly beating the orifice with the palms of her hands, and releasing it again with uncommon dexterity, so as to produce a tattoo, but in perfect time with the other instrument. A third performed upon the Bounty's old copper fish-kettle, which formed a sort of bass. To this exhilarating music three grown-up females stood up to dance, but with a reluctance which showed it was done only to oblige us, as they consider such performances an inroad upon their usual innocent pastimes. The figure consisted of such parts of the Otaheitan dance as they thought most decorous, and was little more than a shuffling of the feet, sliding past each other, and snapping their fingers; but even this produced, at times, considerable laughter from the female spectators, perhaps from some association of ridiculous ideas, which we, as strangers, did not feel; and no doubt had our opinion of the performance been consulted, it would have essentially differed from theirs. They did not long continue these diversions, from an idea it was too great a levity to be continued long; and only the three before mentioned ladies could be prevailed upon to exhibit their skill. One of the officers, with a view to contribute to the mirth of the colonists, had obligingly brought his violin on shore, and as an inducement for them to dance again, offered to play some country dances and reels, if they would proceed; but they could not be tempted to do so. They, however, solicited a specimen of the capabilities of the instrument which was granted, and, though very well executed, did not give the satisfaction we had anticipated. They had not yet arrived at a state of refinement to appreciate harmony, but were highly delighted with the rapid action of the fingers, and always liked to be within sight of the instrument when it was played. They were afterwards heard to say, that they preferred their own simple musical contrivance to the violin. They did not appear to have the least ear for music: one of the officers took considerable pains to teach them the hundredth psalm, that they might not chaunt all the psalms and hymns to the same air; but they did not evince the least aptitude or desire to learn it.

It seems probable, that what Beechey mistook for a lack of gaiety was in reality merely shyness, a trait which still persists among the descendants of the mutineers. They very likely performed among themselves as they evidently were not entirely unaware of Tahitian dances. Brodie (15, p. 21) in 1850 found dancing as a form of amusement.

> Edward Quintal brought his fiddle; he had picked up some hornpipe and reel tunes by ear on board ship, which he really played with great spirit, and the true artistic twang, not omitting the stamp and wriggle, or the grind upon the fourth string. . . .
>
> Some of the islanders danced very well, not waltzes certainly, but reels. The women never dance. We three, Carleton, Taylor, and myself, danced a Scotch reel, which threw the spectators into extasies. The women shrieked with laughing. We ended with blindman's-buff and many other innocent games, in which the ladies joined: there was every sort of sky-larking possible.

The spontaneity of the Pitcairn Islanders is well illustrated in the description by Young (92, pp. 101-102) of merry-making during a celebration in honor of Queen Victoria's birthday in 1848:

> The men were invited to come and join in the merry-making and they obeyed with alacrity. All work was laid aside, and everyone entered heartily into the sports and games that followed. . . . The daughters of the mutineers, being now themselves the grandmothers, entered with zest into the sports, and contributed not a little to the general entertainment by reviving many of the games learned from their Tahitian mothers.
>
> They introduced into their games and sports the beating of calabashes with sticks, performed with extreme precision, to which the players kept time, moving with noiseless step and an easy grace that was pleasing to witness. This performance was called the *ihara*. Another native dance, the *uri*, was performed by Sussannah, the girl of fifteen who came in the Bounty, now an old woman of seventy-four, and blind in one eye. She displayed remarkable liveliness in honor of the Queen's birthday, and her performance provoked mirth from the younger people, who had never seen the dance before. . . .
>
> The merry players kept up the dancing to a late hour. What mattered if most of them danced with bare feet; that did not affect their light-heartedness and happiness. A drum and tambourine supplied all the music they wanted. The island boasted one fiddle but no one considered himself sufficiently expert to volunteer to play.

Ellis (34, vol. 1, p. 298) describes the native dances in the Society Islands as follows:

> . . . . the *heiva* was performed by men and women. . . . Their movements were generally slow, but remarkably regular and exact; the arms, during their dances, were exercised as much as their feet. The drum and the flute were the music by which they were led; and the dance was usually accompanied by songs and ballads. . . . The *patau*, or prompter, sat by the drum and regulated the several parts of the performance. After the athletic exercises of the day, the dances ensued in the evening, and were often continued till the dawn of the following morning.

It is clear that the dances performed on Pitcairn were Tahitian dances which the wives of the mutineers retained for festive occasions. The Pitcairn Islanders, however, soon learned modern dances from American whalers and from the officers of British men-of-war. On Norfolk Island at the present day all dances are imported; nothing of the old Tahitian dances remains.

The conclusion of Beechey that the Pitcairn Islanders were deficient in a love for music needs some qualification. It is naturally difficult to measure innate musical sense, and it should be remembered that unaccustomed music finds an unwelcome reception even in American music centers. The fact that the islanders did not respond to the violin on its first performance does not indicate that they altogether lacked an "ear for music." Other visitors to Pitcairn testify to the ability of the people to carry on relatively intricate part singing. Carleton, a companion of Brodie, who was stranded on Pitcairn in 1850, taught the islanders part singing, and he records his amazement at their aptitude. Nicolas (66) marveled at the beauty of their voices.

> In the evening, it being a beautiful moonlight night, we all met in front of the house where the organ is kept. The islanders then sang several hymns and touching melodies, one of which, from its simple pathos and from the exquisite manner in which it was sung to the tune of "Long, long ago," I believe I shall never forget. The voices of the islanders are both powerful and sweet, and the thrill of rare and unexpected pleasure I experienced on hearing them sing the above song, was never surpassed, not even when listening to Jenny Lind. This may seem going too far; and so may many other of the statements I make in speaking of the Pitcairn Islanders.

Moresby (63) also speaks in praise of the Pitcairn singing:

> They sang two hymns in most magnificent style, and really I have never heard any church singing in any part of the world that could equal it, except at cathedrals, and the whole of the credit is due to Mr. Carleton, who was left behind by accident from a whaler.

On Norfolk Island the people have a choral society, which meets each week and is well attended. They sing numerous modern English ballads, but formerly hymns were the favorites. Besides singing, music is furnished by such instruments as the violin, cornet, and piano. There is an excellent pipe organ in the mission chapel, where services are held once a month. I saw only one graphaphone. Some of the islanders are good musicians and a few have been musically educated

at Sydney. Many have very pleasing voices which they delight in using.

Other forms of amusement and sport at Pitcairn were swimming, kite flying, and games of ball. Wrestling also was practised as a diversion among the men. Many of the visitors write in admiration of the skill of the islanders in the water. Beechey (6) observes:

> They frequently swim around their little island, the circuit of which is at least seven miles, and the women are nearly as expert as the men.

Moresby (63) describes the water sport, surf riding, which evidently is of Polynesian origin:

> One of their greatest amusements is to have a slide, as they term it; that is, to take a piece of wood about three feet long, shaped like a canoe, with a small keel (called a surf board); they then, holding this before them, dive under the first heavy sea and come up on the other side; they then swim out a little way until they see a rapid heavy sea come rolling in, the higher the better; they rest their breast upon the canoe or surf board and are carried along on the very apex of the surf at a prodigious rate right upon the rocks, where you think nothing can save them from being dashed to pieces, the surf seems so powerful; but in a moment they are on their legs and prepared for another slide.

On Norfolk Island the sports and amusements are many and varied. The purely physical type of sport such as swimming, surf riding, wrestling, and ball playing, which their ancestors on Pitcairn indulged in, are still continued. More recent importations include cricket, tennis, and association football, as played by the Australians. There are about a half-dozen tennis courts on which both men and women play with considerable ability. The more active in sport are organized into teams, which meet annually in competition for a shield. Gentler forms of sport are croquet and golf played on a nine-hole course roughly improvised from a paddock. More sedentary games are checkers, chess, bridge, and whist. Horse races are held about once a year. In all these sports the islanders are proficient. Dancing is a favorite means of entertainment. Once a week a general dance is held in Rawson Hall, a stone barn remaining from penal days, at which such dances as the one-step, waltz and recently the fox-trot are danced to music furnished by an orchestra made up of islanders. Occasionally an entertainment is held, consisting of instrumental and vocal music and recitations. Several years ago a cinema was installed and now a moving picture show is given weekly, a shilling being the price of admission.

FOOD AND COOKING

The principal foods of the Pitcairn Islanders were yams, taro, and sweet potatoes. In the early days of the settlement, fish was eaten once or twice a week but later, because of its scarcity, it was not used so frequently. Meat was not a large element in the dietary regimen. Goat meat was not favored and only wild goats shot in the mountains were eaten. Pork was to be had about once a week and during the yam-digging season, a period of hard work, each family slaughtered a pig which provided abundant meat for the duration of the harvest. Beechey (6, pp. 87-88, 94) writes that a Pitcairn Island meal "consisted of baked pig, yams and taro and, more rarely, sweet potatoes," and describes the general food resources as follows: (See also pp. 20-21.)

> The production of the island being very limited and the intercourse with the rest of the world much restricted, it may be readily supposed their meals cannot be greatly varied. However, they do the best with what they have, and cook it in different ways, the pig excepted, which is always baked. There are several goats on the island but they dislike the flesh, as well as the milk. Yams constitute their principal food; these are boiled, baked, or made into pillihey (cakes), by being mixed with cocoa-nuts; or bruised and formed into soup. Bananas are mashed, and made into pancakes or like the yam, united with the milk of the cocoa-nut into pillihey, and eaten with molasses, extracted from the tee-root. The taro-root, by being rubbed, makes a very good substitute for bread, as well as the bananas, plantains, and *appai*. Their common beverage is pure water, but they made for us a tea, extracted from the tee-plant, flavoured with ginger, and sweetened with the juice of the sugar-cane. When alone, this beverage and fowl soup are used only for such as are ill. They seldom kill a pig, but live mostly upon fruit and vegetables. . . . They have all a great dislike for spirits, in consequence of McCoy having killed himself by too free an indulgence in it; but wine in moderation is never refused. . . .

The child when weaned is fed upon *popoe* made from ripe plantains and boiled taro rubbed into a paste.

Fruits were abundant on Pitcairn and naturally formed an important part in the diet of the islanders. Oranges, bananas, and plantains were especially common. Breadfruit was much used during the early years of the settlement but the trees in later years did not yield so productively and the supply was diminished. Other food products were pumpkin, cabbage, onions in small quantities (they did not thrive well on the island), pineapples, lime melons, paw-paw, and beans. Eggs of the domestic fowl and wild birds were used. One of the first deaths by accident on Pitcairn was that of the Tahitian wife of the muti-

neer, Quintal, who fell from a cliff while searching for birds' eggs. Sugar was obtained principally from sugar-cane by bruising the cane and extracting the syrup. Brodie says that a sugar mill existed with a capacity production of 6 cwt. The ti plant also was used for the production of sugar. Salt was obtained by boiling sea water in a great copper kettle which had survived the wreck of the *Bounty*. It was used with meat to some extent, but salted meat seems not to have been a favorite food.

Famine was by no means unknown on Pitcairn. At several times the descendants of the mutineers suffered severely through lack of food. This food shortage appeared only toward the end of their residence on Pitcairn and was perhaps due to the increase of population with a decrease of the margin of safety in the food supply. Armstrong (1) says that in 1849 many of the settlers had packets of biscuits (probably ship biscuit), tied up in the beams of the houses pending famine. The effect of a famine is described in a letter from Moresby (63):

> We observed that all the men looked ill and poor which, they told us, was the effect of the long drought having disappointed them in their crops. This had caused not quite a famine, but so near it that for months they had been reduced to pumpkins, berries, cocoanuts and beans for their existence. When we got on shore, the effect of so low a diet was plainly visible; they were not nearly the same gay people they were before; one and all looked thin and careworn.

In the early days of the Pitcairn settlement cooking was necessarily very primitive, but after trading contact was established with the outside world culinary practice improved. Brodie found that the primitive method of cooking still survived in 1850, although they sometimes used "ovens similar to ours." The cooking was done by the women who gave much attention to it. Each cottage had its own detached cookhouse; there were no fireplaces in the dwelling. The actual method of cooking is described by Murray (65, p. 161) as follows:

> Their ovens, like those at Tahiti, described by Captain Cook, are formed with stones in the ground, sufficiently large to contain a good-sized pig, and are lined throughout with stones nearly equal in size. These having been made as hot as possible, are covered with some broad leaves, generally of the ti-plant, and on them is placed the meat. If it be a pig, its inside is lined with hot stones, as well as the oven. Such vegetables as are to accompany the meal are then placed around the meat that is to be dressed. The whole is covered with leaves of the ti plant, and buried beneath a heap of earth, straw or rushes and boughs, which by a little use become matted into one mass. In about an hour and a quarter the meat is sufficiently cooked.

In general there were two meals a day. On rising in the morning only a light refreshment or nothing was eaten. At noon a plain but substantial meal, usually of yams and other vegetables was prepared. After the day's labor, about seven o'clock, another meal was served which consisted principally of vegetables with fish once or twice a week and fowl or pig less often. Beechey writes that their meals were not confined to definite hours, but that noon was the usual eating hour. Wood says "they eat when they are hungry." On Sunday no meal was cooked, all preparation having been made the day before. In the following extract, Beechey (6, p. 244) describes a meal which was much more elaborate than was the usual meal of the islanders:

> The smoking pig, by a skillful dissection, was soon portioned out to every guest, but no one ventured to put its excellent qualities to the test until a lengthened Amen, pronounced by all the party had succeeded an emphatic grace delivered by the village parson. "Turn to" was the signal for attack, and as it is convenient that all the party should finish their meal about the same time, in order that one grace might serve for all, each made the most of his time. . . . Welcome cheer, hospitality, and good humor, were the characteristics of the feast, and never was their beneficial influence more practically exemplified than on this occasion, by the demolition of all that was placed before us. With the exception of some wine we had brought with us, water was the only beverage. This was placed in a pitcher at one end of the board, and when necessary, was passed around the table, a ceremony at which, in Pitcairn's Island in particular, it is desirable to be the first partaker, as the gravy of the dish is invariably mingled with the stream: the natives, who prefer using their fingers to forks, being quite indifferent whether they hold the vessel by the handle or the spout.

INDUSTRIES

The principal occupation of the Pitcairn men was agriculture. Such tasks as repairing houses, building fences, and caring for the livestock was a part of every man's ordinary duties. Simple cabinet work, such as making of work boxes, chests of drawers, writing desks, and various small articles, was taught to the islanders by John Buffett and continued by the young men. The material used principally was the *mero*, a close-grained wood, dark red in color, which took a very high polish. An indigenous wood of yellowish color was used for inlay and other purposes. A chest of drawers made for Queen Victoria had a bottom of *mero* wood and drawers of breadfruit wood. Brodie states that the boxes

were very handsome and found a ready sale to visitors at 20 to 30 shillings each. Walking sticks made from *mero*, coconut, or palm trees were also in great demand. Wood (89), in a description of their houses, writes: "They show a progressive improvement in the mechanical part of them which would not disgrace a European tradesman."

Hats and baskets were manufactured by the women of Pitcairn both for domestic use and for sale to the passing vessels. The women of Norfolk Island also are skilled in making hats and mats, which they sell at prices depending upon the quality of the workmanship.

In the early days on Pitcairn, when cloth was still a rarity, the making of tapa was one of the principal occupations of the women. The Tahitian women who accompanied the mutineers knew the Polynesian method of tapa making and taught it to their daughters. Beechey speaks of the crispness and freshness of the tapa bed clothes upon which he slept. It is impossible to give the exact date of the disappearance of the manufacture of tapa, as in all probability the use of cloth came gradually and the making of tapa disappeared only when foreign fabrics were easy to obtain, but tapa was made as late as 1850. Brodie (quoted by Young, 92, pp. 65-66) says:

> But their principal occupation, during the colder months of the year, was the making of native cloth. This native cloth, or tapa, is made from the bark of the aute plant (pronounced "outy"), i. e., the paper mulberry, and has very much the nature and consistency of paper. The work is exceedingly laborious and wearisome, and when the yield of the plants is large, it sometimes occupies months in doing. Yet it was necessary to be done, as that material supplied nearly all the bedding used then. Frequent washing and exposure to the sun will eventually deprive the material of its stiffness and noisiness, and in cold weather it affords a warm covering, as it excludes all air. It is colored a bright reddish brown, and rendered tougher by being dyed in the sap obtained from the doodooee (candle-nut tree). This dye is made by steeping the bark of the doodooee in water. Formerly it was used for clothing.

Beechey (6, pp. 96-97) gives the following account of tapa:

> The cloth tree is preeminently useful and supplies the natives with clothing. The manner of its manufacture has already been described. There is, however, a fashion in the beater, some preferring a broad, others a closely ribbed garment for which purpose they have several of these instruments with large and small grooves. If the cloth is required to be brown, the inner bark of which the cloth is made, is wrapped in banana leaves, and put aside for four days; it is then beaten into a thick doughy substance and left till fermentation is about to take place, when it is taken out, and finally beaten into a garment both lengthwise and across. The colour thus produced is of a deep reddish brown hue. The pieces are generally sufficiently large to wrap round the whole body, but they are sometimes divided. . . .
>
> We saw dyes of three colours only in Pitcairn, yellow, red, and brown. The yellow is procured from the inner bark of the root of the *nono* tree (*Morinda citrifolia*) and also from the root of a species of the ginger. We did not see this plant growing, but it is described as having leaves broader and longer than the ordinary ginger, a thicker root in proportion to its length, a darker hue, and not so tubercular. The red dye is procured from the inner bark of the doodoe tree and may have its intensity varied by more or less exposure to the rays of the sun while drying. These dyes are well coloured, but for want of proper mordants, the natives cannot fix them and they must be renewed every time the linen is washed. The method of procuring the brown dye has already been described. The temperate climate of Pitcairn is extremely favourable to vegetation, and agriculture is attended with comparatively light labour.

This process of making tapa is exactly the same as that in the Society Islands described by Ellis (34, vol. 2, p. 172):

> When the bark from the branches of the breadfruit is used, the outer green or brown rind is scraped off with a shell; it is then slightly beaten, and allowed to ferment, or is macerated in water. A stout piece of wood, resembling a beam, twenty or thirty feet long, and from six to nine inches square, with a groove cut in the under side, is fixed on the ground; across this, the bark is laid and beaten with a heavy mallet of casuarina or iron wood. The mallet is usually fifteen or eighteen inches long, about two inches square, and round at one end, for the purpose of being held firmly. The sides of the mallet are grooved; one side very coarse or large, the opposite side exceedingly fine. One of the remaining sides is generally cut in chequers, or small squares, and the other is plain or ribbed. The bark is beaten lengthwise across the piece of wood, and beaten first with the rough side of the mallet, and then with those parts that are finer.
>
> Vegetable gum is rarely employed; in general, the resinous matter in the bark is sufficiently adhesive. The fibres of the bark are most completely interwoven by the frequent beating with the grooved or chequered side of the mallet, and when the piece is finished, the texture of the cloth is often remarkably fine and even, and the inequalities occasioned by the fine grooves, or small squares, give it the appearance of woven cloth. During its manufacture, the cloth is kept saturated with moisture, and carefully wrapped in thick green leaves every time the workmen leave off; but as soon as it is finished, they spread it to dry in the sun, and bleach it according to the purpose for which it is designed.

Dyes were obtained on Pitcairn Island in the same manner as in the Society Islands; the yellow from bark of the *nono* (*Morinda citrifolia*) infused in water, the red from the "doodooee" (*Aleurites triloba*). There are no descriptions of the designs used by the tapa-makers on Pitcairn in decorating their cloth, but very probably the method of employing leaves for imprinting pat-

terns which was used in the Society Islands was also resorted to here.

Trade or barter assumed quite large proportions at Pitcairn Island during the decade 1840 to 1850, when the whaling industry, carried on principally by Americans, was particularly active in Pacific waters. In 1846, 48 vessels stopped at Pitcairn, most of them whalers from New England ports. The method of trading is pictured by Murray (65, pp. 165-166) as follows:

> After some preliminary conversation, the representatives of the several families, one at least from each house, assemble; and after a hearty welcome, and the interchange of friendly expressions, inquire what is wanted for the vessel, as to vegetables, refreshments, etc. A list is handed in of the articles in demand, such as yams, sweet potatoes, etc., the price of these goods being always the same in time of scarcity as of plenty. The inhabitants then, in their turn, inquire of the captain what he has to dispose of. This is generally found to be coarse cotton cloth, soap, oil, etc., with perhaps some small quantities of lead or iron. While the captain is engaged in conversation with the teacher, on matters of mutual and general interest, . . . the inhabitants retire and consult amongst themselves what each person's proportion of the captain's wants amounts to. This being settled, each repairs to his own plantation to procure his part, which in every instance is, as far as possible, an equal share from each family.
>
> Such is the reliance placed by the strangers on the honesty and integrity of the islanders, that in no case does the captain think it necessary, either himself or by proxy, to be present at the weighing or measuring of the articles required. One of the islanders is appointed to remain at the market place, to take an account of the things sent on board; and the mode of dealing is always cheerfully acceded to by the authorities of the vessel. The articles are removed from the market place to Bounty Bay, where they are deposited at the captain's risk, and from whence they are conveyed in boats; or if the surf is heavy, the goods are packed in casks, which are conducted by the natives, who swim with them through the heavy surf to the boats lying outside the broken water.

On Norfolk Island trade is not in a very flourishing condition. For various reasons such products as fruit, have not found a ready market. The tourist trade has increased in recent years and now forms a fairly lucrative business. In 1921 the imports were about £22,600, and the exports about £13,000. Much of the imports in this year were directed to the Cable Station but the tourists were also responsible for the excess of imports over exports. During 1920 and 1921, lemon juice and lemon peel to the amount of 15,303 pounds were exported; in 1923, only 3,754 pounds. This drop in exports was largely due to the decline of the lemon juice and peel industry. Other fruits are shipped to Australia but do not find a ready market, as most of the fruits of Norfolk can be grown also in New South Wales and marketed at a cheaper price. Frozen fish is sent to the mainland in small quantities. Whaling brings to the pocketbooks of the islanders several hundred pounds annually, but the demand for whale oil is not great and does not permit expansion. Other industries suggested as favorable for development on Norfolk Island are extraction of starch from the kumera, cassava, arrowroot; the growing of cotton, coffee, and tobacco; preserving fruits; making paints from the abundant ferric deposits; and packing of frozen fish.

AGRICULTURE

On Pitcairn Island agriculture was the principal occupation of the men as well as of the boys and unmarried girls. Captain Pipon suggests that the need of the girls in the fields was the reason for Adam's disapproval of early marriages. According to Brodie, the agricultural methods were primitive. He writes that they were not aware of the value of subsoil ploughing, or the virtues of fertilizer. Beechey, however, states that it had become necessary, even as early as 1825, for them to use seaweed as a fertilizer. The soil, of volcanic origin, was rich. With comparatively little labor abundant crops were raised. In 1849 Wood speaks of seeing some nicely cultivated potato fields that for ten years had yielded two crops a year without suffering deterioration, and yet no fertilizer was needed. Beechey says that only one crop of each kind was raised a year, and that the land was not allowed time to recover itself.

Agricultural implements at first made from the iron of the *Bounty* were later replaced by implements obtained from passing vessels. "All their field work," says Brodie, "is performed with the hoe; by the use of which, however, and not sparing their labor, they contrive to raise abundant crops of food." Beechey (6, p. 97) states:

> The principal cultivated crops were yams, taro, and sweet potato. The yam was the most important of all the crops. This was planted in September and the crop was matured in April or May. The yam is reproduced in the same way as the potato; taro requires either a young shoot to be broken off and planted or the stem to be removed from the root and planted, after the manner of raising pine-apples. The yappai is a root similar to the taro and treated in the same way.

Beechey adds that the yam, taro, and sweet potato thrive extremely well in Pitcairn, but that the Irish potato does not. Peas and beans yield a scanty crop, the soil being too dry. Onions do

not thrive here, but pumpkin and watermelons bear exceedingly well.

It is said that Adams kept a journal in which he entered the nature and the quantity of work performed by each family, what each had received, and what was due on account.

The size of the crops, of course, increased with the growth in population. Beechey found that the islanders, through experience, estimated that each year 1,000 yams for each person was required, exclusive of other foods. During a storm in 1845, the Register records that 300 coconut trees, a yam ground containing 1,000 yams, and 4,000 plantain trees were destroyed. This was evidently only a small part of the island food resources, as in spite of this loss there was no famine.

Other subsidiary products such as plantain, bananas, coconuts, and breadfruit were cultivated. Tropical fruits were abundant and grew wild. Young (92, p. 52) writes:

> The bright blossoms that here and there meet the eye have been introduced from time to time, mostly by the captains of passing ships, who have kindly given from their own limited stock. Also many seeds have been sent out from England and America and the Sandwich Islands; but only those from the last named place have succeeded well, most of the others, owing greatly, no doubt, to the want of proper culture, having proved a failure. However, through the kindness of friends, the little island is not destitute of nature's loveliest productions.
>
> First among the principal fruits that the island produces are the orange. The trees begin to be in blossom from the end of July at the earliest and continue flowering until October. The season for the fruit is from April to November. As the trees occasionally produce a second crop, it is not unusual to have them in fruit the year round. Watermelons, muskmelons, pineapples, rose-apples, and figs are in season from November to April. Bananas, of which there are a few varieties, can be had all the year around, but are at their best from January to June. The guava grows wild, and from March to July the trees are laden with fruit. Grapes might be cultivated. The sugar cane is also one of the principal productions of the island, the rich syrup made from its juice being used instead of sugar. Arrowroot is cultivated with profit. The process of making it involves much labor. The plants are set in the ground in the months of October and November, and the roots are fully matured by June. The yam crop is set out at the same time as the arrowroot and takes the same length of time to come to maturity.
>
> Such are some of the present productions of the little island that became the hiding place of the mutineers. They themselves doubtless introduced the bread-fruit, the taro, cocoanut, yam, and one variety of sweet potatoes. The places once owned and cultivated are still called by their names, John Adams' Bread-fruit Patch, Ned Young's Ground, McCoy's Valley, and so on through the whole list.

Brodie (15, p. 96) speaks of tobacco and sugar-cane as follows:

> I have observed many patches of tobacco plant; but they do not well understand the art of curing the leaf. . . . . The cane does not grow very large, and is little cultivated, on account of the immense numbers of rats upon the island, which do great damage among the canes (sugar-canes).

The plant life on Pitcairn is described in some detail by Beechey (6, p. 95):

> The trees we saw on the road were the *Pandanus* banyan, cocoa, breadfruit (a very large tree), a fern, the mountain plantain, some species of acacia, orange, and lime-trees, etc. Besides these they have the vhe-tree, but it is now very scarce, as are also the two most valuable trees on the island, of which they build their houses, the tafano or flower wood, and the aruni or mero. The former is a yellow wood, very hard and durable when not exposed to wet—of this most of the joiner's work is done. The latter wood is in principal use; it is very dark, like rosewood, very durable, standing exposure to sun, wind, and rain for many years without showing any symptoms of decay. The first settlers' houses were made entirely of it, and are as sound now as the day they were erected, though without paint or covering of any kind; indeed, Mr. Nobb's house and the school are the only two that have been painted or whitewashed even in part.
>
> We found upon Pitcairn Island, cocoanuts, breadfruit (*Artocarpus incisa*), plantains (*Musa paradisaisaca*), bananas (*Musa sapientum*), water melons (*Curcubita citrullus*), pumpkins (*Curcubita pepo*), potatoes (*Solanum esculentum*), sweet potatoes (*Convolvulus batatas*), yams (*Dioscoria sativum*), taro (*Caladium esculentum*), peas, yappai (native name) (*Arum costatum*), sugar-cane, ginger, turmeric, tobacco, tee-plant (*Dracaena terminalis*), doodoe (*Aleurites triloba*), nono (*Morinda citrifolia*) and other species of morinda, parau (*Hibiscus tiliaceus*), fowtoo (*Hibiscus tricuspis*), the cloth tree (*Broussonetia papyrifera*), pawalla (*Pandanus odoratissimus*), toonena (?) and the banyan tree. A species of *Metrosideros* and several species of ferns. The first twelve of these form the principal food of the islanders. The sugar-cane is sparingly cultivated; they extract from it a juice which is used to flavour the tea of such as are ill, by pounding the cane, and boiling it with a little ginger and cocoanut grated into a pulp, as a substitute for milk. In this manner a pleasant beverage is produced.
>
> The tee-plant is extensively cultivated. Its leaves, which are broad and oblong, are the common food of hogs and goats, and serve the natives for wrappers in their cooking. The root affords a very saccharine liquor, resembling molasses, which is obtained by baking in the ground; it requires two or three years after it is planted to arrive at the proper size for use, being then about two inches and a half in diameter; it is long, fusiform, and beset with fibres: from this root they also make a tea which when flavoured with ginger is not unpleasant. The doodoe is a large tree, with a handsome blossom, and supplies ornaments for the ears and hair, and nuts containing a considerable quantity of oil, which by being strung upon sticks serve the purpose of candles. The porou and fowtoo are trees which supply them with fishing lines, rope and cord of all sorts. The tree is stripped of bark while the sap is in full circulation, and dried; a fibrous substance is then procured from it

which is twisted for use; but it is not strong, and very perishable. The cloth tree is pre-eminently useful; and here as in all places in the South Sea where it grows, supplies the natives with clothing. . . . the tooncna tree is large, and from which their houses are built and canoes. It is hard, heavy, red-coloured, and grows on the upper part of the island. There was formerly a great abundance of this wood, but it is now become so scarce as to require considerable search and labour to find sufficient to construct a house. The young trees have thriven partially, arriving at a certain growth, and then stopping. A tree of this kind which was the largest tree on the island measured at the time of our visit, 12 feet in circumference; another was 9 feet 7 and a half inches in girth at five feet from the root; its trunk grew to the height of 30 feet, perfectly straight and without branching.

The banyan is one of those large trees and spreading common in India. Nature has been so provident to this island that there are very few trees in it which cannot be turned to account in some way, and this tree, though it yields no fruit, and produces wood so hard and heavy as to be unserviceable, still contributes to the assistance of the islanders, by supplying them resin for the seams of their boats.

On coming to Norfolk Island the descendants of the mutineers experienced a marked change in diet. The report of the Administrator of Norfolk Island for 1923 (69) enumerates the principal crops, in order of acreage cultivated, as kumeras, maize, kitchen garden, potatoes, green fodder, onions, oats, wheat, and yams. The cultivated fruits, listed in order of the number of trees, plants or vines, are bananas, coffee, passion fruit, oranges, and pineapples.

The wild fruits include guava, lemons, rose apples, and pawpaws. Yams do not hold the important part in agriculture on Norfolk that they did on Pitcairn.

LIVE STOCK

The most common domestic animals on Pitcairn were hogs and goats. These were probably brought by the mutineers from Tahiti. At any rate, Young, as quoted by Beechey (6, p. 65), writes in his Journal dating from 1793, that the hogs had become wild and so numerous that they were destroying the yam fields. It soon became a sport for the mutineers to hunt the wild hog. The goats also bred rapidly, running wild on the island. The fowls which Staines in 1814 (81) mentions as being numerous must have come from the Society Islands. These were at first confined to the common, but many escaped and in time formed a wild flock which proved to be destructive to the banana and plantain crops. Brodie (15, p. 97) says that they were small but bred in large numbers at some distance from the settlement and that they played havoc with the gardens near the village. He writes:

Their domestic animals are in reality a loss to them, the quantity of food they supply being small compared to what they consume; a consideration of great importance, when they are, for the most part, obliged to be kept up and fed on the produce of cultivated ground. A few of the goats are allowed to run loose upon some parts of the island; the number which one family is allowed to keep at one time, being proportioned to the number of the members, but it must never exceed nine. Those which run loose are generally female goats; the males being kept up at home, and fed three or four times a day, until two years old, when they are killed, or sold to the shipping. The females are always brought home a few days before the kidding, after which they are again turned out until the kids are from three to four months old, when they are again brought home and marked; when the female kids and their mothers are again turned out, and the males kept at home. The goats generally remain near the place where they were first turned out, which is accordingly selected as far as possible from the settlement and plantations. Pigs are fed much in the same manner as the goats, which makes them very expensive to rear; what few they have, they do not care to sell, as they are ashamed to ask a remunerating price for what they have actually cost in labour and potatoes. . . . Mr. Nobbs informed me that by the time a large hog (300 pounds weight) was fit to kill, at this season, it usually ate about thirty barrels of potatoes, which, at 8s. a barrel, would be 12 pounds sterling; it need, therefore, be a matter of no surprise that they cannot afford to sell them at a reasonable price.

Cattle never prospered on Pitcairn Island principally because of the lack of pasturage and the cost of hand feeding. There are several recorded gifts of cows and bulls but none of the animals were successfully maintained. Captain Wood writes that two donkeys were brought in as pack animals but that they did not prove satisfactory. Some rabbits were carried to the island in 1849, by Captain Fanshawe, but Brodie warned the settlers that as there were no natural enemies to check their increase the rabbits would escape into the bush and become a pest. Cats were numerous and wild, inimical equally to rats and fowls. Dogs also were plentiful but of a currish appearance.

The Norfolk Islanders have practically all the domestic animals considered essential. Horses, cows, hogs, and fowls are particularly numerous; sheep and turkeys are found in fewer numbers. Live stock is not permitted to run wild on Norfolk as it was on Pitcairn Island. The animals are confined in paddocks where they are allowed to graze. Barns are practically unknown, the cattle and horses remaining in the fields night and day all the year round. Pigs and fowl, however, are closely confined in pens and coops. Except

for some horses, little attention is paid to careful breeding of domestic stock.

POSITION OF WOMEN

It was remarked by many of the visitors to Pitcairn Island that the women occupied a menial position at meals. But Young (92), a descendant of one of the mutineers, attributes the fact that the women waited for the men to finish their meal before they themselves sat down to the table to the shyness of the native women, which they inherited from their Tahitian ancestors. However, it is said that in the privacy of their homes during meals the women ate with the men. On Norfolk Island this ancient custom is not observed. Those Norfolk Island women who have not had much social contact with visitors appear to be extremely shy and reticent in the presence of strangers. On the other hand, some with more social experience are not at all embarrassed by strangers and make friends easily. Undoubtedly there were naturally shy individuals among the islanders, but that characteristic is probably not the result of their Tahitian ancestors, as the stories of Captain Cook and of other travelers give the impression that the women of the Society Islands were not all averse to mingling with visitors. The shyness encountered may with more reason be assigned to isolation.

Beechey (6, p. 76) describes the situation as it existed in the early part of the nineteenth century:

> One regret only intruded itself upon the general conviviality which we did not fail to mention, namely, that there was so wide a distinction between the sexes. This was the remains of a custom very common among the South-sea Islands, which in some places is carried to such an extent that it imposes death on the woman who shall eat in the presence of her husband, and though the distinction between man and wife is not here carried to that extent, it is still sufficiently observed to exclude all women from the table, if there happens to be a deficiency of seats. In Pitcairn's Island they have settled ideas of right and wrong, to which they obstinately adhere; and, fortunately they have imbibed them from the best source. In the instance in question, they have, however, certainly erred; but of this they could not be persuaded, nor did they, I believe, thank us for our interference. Their argument was, that man was made first, and ought, consequently, on all occasions, to be served first, a conclusion, which deprived us of the company of women at table, during the whole of our stay at the island. Far from considering themselves neglected, they very good-naturedly chatted with us behind our seats, and flapped away the flies, and by a gentle tap, accidentally or playfully delivered, reminded us occasionally of the honor that was done us. The conclusion of the meal was the signal for the women and children to prepare their own, to whom we resigned our seats and strolled to enjoy the freshness of the night.

In 1800, when John Adams was the only man left at Pitcairn, it was necessary for the Tahitian women and the oldest of the children to work in the fields in order to support the population, which consisted of more than 20 individuals. The custom of allowing all girls and women capable of heavy tasks to shoulder their full share of burdens continued by necessity and explains in part the situation criticized by Nicholas in 1853 (66, p. 301); "If I am asked, Have they *no faults?* I answer, Yes, two, to show they are children of Adam. The first is that the men seemed to allow the women to work harder than themselves."

The social position of the women of Pitcairn was in no way inferior to the men; they were allowed to vote from the earliest days of the settlement, long before women's suffrage was thought of being agitated in Europe or America.

On Norfolk Island it cannot be charged against the men that they exploit their wives. Women are rarely seen in the field. Their social and political status is the same as for men.

SOCIAL RELATIONSHIPS

The social relations of the Pitcairn Islanders were those of a large family. In a group as small as this with the same ancestry, similar occupations, and community of interests there could be no social divisions or distinctions. All the children of the first generation were raised together with one man, John Adams, as their "father." Consequently this simple social life was continued in the succeeding generations. Other factors tended to create a homogeneous group. Inbreeding was very prevalent; cousins marrying to such an extent that it was said that every one on the island was related. The group was small; in 1850 the population was about 150, all living together in a small village. Pitcairn has often been described as a patriarchal state with John Adams at the head. Although a great deal of the exuberant praise which has been written about the idyllic character of the colony is in all probability hyperbolic, nevertheless the fact remains that here was a group living in extraordinary harmony. For many years there were no laws nor regulations to govern the conduct of the individual. It would be fallacious, of course, to believe that there was no friction between individuals, yet there were no internal disruptions or schisms which might lead

to serious consequences. During the period of Joshua Hill's rule there were dissensions but these were due to this impostor and disappeared with his removal. The early writers on Pitcairn emphasized the fact that these people, who lived in so ideal a condition as one large family without quarrels or bloodshed, were the descendants of mutineers, who themselves on Pitcairn had murdered their fellow Englishmen, slaughtered the native men in the colony and committed other violences.

A true picture of the life of the islanders with all the realistic details would enumerate the petty quarrels, individual ambitions and grievances but it would also describe the fine feeling of solidarity and social harmony which existed on the island. Barrow (2, pp. 313-314) writes:

> It appeared that from the time when Adams was left alone on the island, the sole survivor of all the males that had landed from the *Bounty*, European and Otaheitan, the greatest harmony had prevailed in their little society; they all declared that no serious quarrels ever occurred among them, though a few hasty words might now and then be uttered, but, to make use of their own expression, they were only quarrels of the mouth. Adams assured his visitors that they were all strictly honest in all their dealings, lending or exchanging their various articles of live stock or produce with each other, in the most friendly manner; and if any little dispute occurred, he never found any difficulty to rectify the mistake or misunderstanding that might have caused it, to the satisfaction of both parties.

Brodie (15, p. 101) speaks of the harmonious family relationship:

> Quarrels and swearing are unknown amongst these islanders, who are as one large family bred up together; they are, in point of fact, all more or less related to each other, and look upon each other more as brothers and sisters than anything else. The children appear to be more nursed by their relations than by their mothers, which makes it often difficult to distinguish the married from the unmarried.

Family ties were very strong among the Pitcairn Islanders. Beechey says that the families were patterns of conjugal and parental affection. In affliction everyone was ready to help. In a letter in which he describes an accident which happened to his son, Reuben, Nobbs writes (67, pp. 265-266):

> Every person was anxious to render assistance; the greater part of the male inhabitants remained at night, to be ready at a moment's warning to do anything which might be required. . . . The men and grown lads have formed themselves into three watches, to attend his wants both day and night.

There was a great deal of freedom in social intercourse. The islanders were in the habit of walking into others' houses with the same freedom as into their own. Their kindness to one another is illustrated by Barrow (2) in the following excerpts:

> Captain Waldegrave, like all former visitors, bears testimony to the kind disposition and active benevolence of these simple islanders. The children, he says, are fond and obedient, the parents affectionate and kind toward their children. None of the party ever heard a harsh word made use of by one towards another. They never slander or speak ill of one another. If any question was asked as to the character or conduct of a particular individual, the answer would probably be something of this kind, "If it could do any good, I would answer you; but as it cannot, it would be wrong to tell tales"; or if the question applied to one who had committed a fault they would say, "It would be wrong to tell my neighbour's shames." The kind and benevolent feeling of these amiable people is extended to the surviving widows of the Otaheite men who were slain on the island, and who would be left in a helpless and destitute state, were it not for the humane consideration of the younger part of the society, by whom they are supported and regarded with every mark of attention.

Speaking of the time when the necessity for leaving Pitcairn had become pressing and demanded immediate attention, Brodie (15, p. 171) writes:

> For although the necessity exists, and its imperative demands cannot be much longer avoided, such is the affection existing between the members of this unique Society that they are intent only upon putting off the "evil day" of separation.

On Norfolk Island the simple relationships which prevailed on Pitcairn Island do not exist. In contrast to social life on Pitcairn, society on Norfolk has become much more complex and diversified, although still simple from an American point of view. With the increase of numbers and more intimate contact with Australia, there has been a modification of manners. In a population of more than 600 it is not possible to be on intimate terms with everyone. Consequently there has been a segregation which, although not a rigid one, is nevertheless felt by the islanders. With the increase of tourists to Norfolk Island, some of the islanders maintaining boarding houses have encouraged more elaborate social entertainment for their guests, and a fairly definite group attend and give most of the social entertainment furnished on the island. This group, however, is based on no other considerations than personal qualifications of popularity and fondness for social intercourse. It should be understood, however, that nothing like social stratification exists on Norfolk. The feeling of common origin, the

close relationship which they bear to one another, and the lack of wealth hold the people together as one group.

With the disappearance of the old familiar relationship has gone to a large extent the community of spirit, which in the early days of the colony prompted all the men to aid a new householder in erecting his house. But in spite of this natural change in the social relations there is a definite feeling of comraderie and lack of formality which extends even to the casual visitor. As Waldegrave (88) mentioned for the Pitcairn Islanders in 1830, the present day Norfolk islanders never allow their personal quarrels to come to the attention of the tourist or casual visitor. Rarely does an islander inform a stranger of any scandal or gossip which is derogatory to a fellow islander. That there is scandal becomes known only after long acquaintance; an additional indication of the social solidarity of the group.

EDUCATION

On Pitcairn, the education of the young children was undertaken by Young and Adams. Young, who had had a good education, died soon after he assumed this responsibility, leaving to Adams the task of instilling into the minds of the children the rudiments of an English schooling. Unfortunately Adams could read only with difficulty and learned to write only toward the end of his life, but he was able to give instruction in the Bible and after a fashion to impart a few fundamentals of reading and arithmetic. There were about 19 children at this period, most of them between the ages of seven and nine.

In 1823 John Buffett, a man of some education, was left on the island. "In this man," says Beechey, "they have fortunately found an able and willing schoolmaster. He had belonged to a ship which visited the island, and was so infatuated with the behaviour of the people, being himself of a naturally devout and serious turn of mind, that he resolved to remain among them; and in addition to the instruction of the children, has taken upon himself the duties of clergyman and is the oracle of the island."

In 1829, John Buffett was succeeded by George Hunn Nobbs, who appeared to be much better educated and a man of capabilities. He, like Buffett, was attracted to the island by the glowing reports of the attractive life of the islanders. After many adventures and hardships, he settled at Pitcairn and became the leader of the community, a position he held for many years, until his death on Norfolk Island. When the duties of physician and minister were added to that of schoolmaster, Nobbs relinquished most of his school duties to one of the islanders capable to taking over some of the teaching. Armstrong (1, p. 162) writes, "You will be glad to hear that they are well educated. The young men are instructed in navigation and some of the lower branches of mathematics."

Captain Worth (90, p. 193) in 1848 said, "Their learning and attainments in general education and information are really astonishing." Captain Freemantle (38, p. 163) in 1833 makes the comment, "They appear to have been well instructed, and many of them capable of reading and nearly on a par with children of the same age in England."

The laws regulating attendance, instruction, and payment of tuition are given by Murray (65, pp. 253-54) as follows:

> There must be a school kept, to which all parents shall be obliged to send their children, who must previously be able to repeat the alphabet, and be of the age of six to sixteen. Mr. Nobbs shall be placed at the head of the school, assisted by such persons as shall be named by the chief magistrate. The hours shall be from seven o'clock in the morning until noon, on all days excepting Saturdays and Sundays; casualties and sickness excepted. One shilling, or an equivalent [in yams, potatoes, plantains or labor], shall be paid by each child per month, by the parents, whether the child attend school or not. In case Mr. Nobbs does not attend, the assistant appointed by the magistrate shall receive the salary in proportion to the time Mr. Nobbs is absent.
>
> The chief magistrate is to see the labour well performed; and the goods which may be given for money, shall be delivered either at the market place or at the house of Mr. Nobbs, as he may direct. It may be here remarked that the worthy school master having become god-father to many of the children, charges nothing for the instruction of his god-children.

The curriculum is given in a letter from the islanders to Captain Hope in 1847 (45, p. 200) and in a statement by Brodie:

> We attend school five days in the week, five hours each day. Our routine of school duties is as follows: namely, commence with prayer and praise; conclude with the same. Monday, recital of weekly tasks, reading the holy scriptures, writing, arithmetic, and class spelling. Tuesday, the same as on Monday, Wednesday, reading in history and geography, transcribing select portions of Scriptures. Thursday, similar to Monday and Tuesday. And on Friday, which is the busiest day of the week, transcribing words with their meanings from Walker's dictionary; read hymns or rather devotional and moral poetry; repeat Watt's and the Church Catechism; arithmetical tables, etc.; and emulative spelling

concludes the whole: we are generally an hour longer at school this day than any other. On Wednesday afternoon the older pupils attend the Bible class, with their parents.

There was no school on Saturday and a holiday was declared whenever a vessel called at the island.

Brodie (15, p. 94) writes:

Reading, writing, geography, mathematics, etc., are taught. Every child must be able to repeat the Lord's Prayer, and Belief, before he goes to school. There are now about fifty scholars, some of whom have made very great progress. The writing of some, in particular, was equal to that which might be met with in any merchant's office in London. Many of them attend school until they are married, and some even afterwards. School is a great delight to the young people; they are very anxious to learn everything which they think will be of any service at all to them. I have been often much surprised to find many of them make use of words and sentences of which I little thought they could have known the meaning.

The school house, a building about 56 feet long by 20 feet wide, was used on Sundays as a church and was frequently resorted to as a place of general assemblage. Captain Wood, in 1849, describes it as "a long room, furnished with cross benches, fitted with ink-stands, etc., and at the upper end a square compartment is formed by the benches, with a table and seat for the master, and against the end is the pulpit or reading desk."

At present on Pitcairn Island instruction is given by one of the native women, although for some time the school was in charge of an American teacher.

On Norfolk Island the school system is essentially the same as that for Australia. School is compulsory up to the age of 15 and is free. The head master and his two assistants are from the "mainland" and are trained in Australian colleges. In addition there is an assistant who is a native of Norfolk Island. The maximum enrollment in 1923 was 133. Mr. Barnes, the Principal Teacher, during my visit to Norfolk Island, characterized the children as equal in scholarship to those in Australia. The school building consists of two large rooms equipped with forms and blackboards. The school library consists of about 300 books, which are in general circulation. Practically everybody on the island at the present time is literate.

PROPERTY

On their arrival at Pitcairn, the mutineers divided the island, with the exception of the village and common which were held communally, into equal parts, each of the nine Englishmen receiving his allotment. The Tahitian men who accompanied the mutineers were not given property, but were forced to help work the land and soon occupied the position of slaves to the Englishmen. Wood (89, p. 210) describes the result of this distribution after some fifty years of operation:

The plan they go on, and which could not now be disturbed without some injustice, is this: The original settlers, the mutineers, marked and divided out the land into nine equal parts; these equal parts were again equally subdivided among their children, and again among the children of the third generation have also a portion of their subdivisions. This, though apparently fair enough at first, has led to evils they did not anticipate; for instance, one of the original settlers had a family of eleven, his ninth was, therefore, divided into eleven parts. Again, one of his daughters married and has a family of eleven, so that her children will have but the eleventh of her eleventh portion; whereas, another of the first lot, who has only one son and daughter (the latter of whom survives unmarried), left by the same rule the whole of his ninth to her, so that she now has as much land as twenty-two of the first named family. This system cannot last long, unless the landlords emigrate, which they seem very unwilling to do, though this want of sufficient ground is a bar to many of them marrying.

Barrow (2) says that property could not be obtained by a foreigner except by marriage or by purchase from one of the islanders.

Captain Waldegrave in 1830, and Lieutenant Lowry in 1839, estimated that there was sufficient land to supply the needs of the islanders for some time. Waldegrave reckoned that eleven-twelfths of the land was still uncultivated and that the island could support a population of one thousand, which he predicted would occupy Pitcairn in the course of the century. Nevertheless, the settlers frequently complained about the lack of land available and the paucity of agricultural land was a primary factor in determining the migration to Norfolk Island in 1856. (See p. 8.)

Such structures as the schoolhouse, the sawmill, water tanks, and public roads were held as public property. But the rocks on the seashore were held as private property, as they were of value for the collection of sea salt. Considering the patriarchal form of life and the close family relationship, it is not surprising to learn that there was considerable laxity in property rights in such personal things as books, which were kept on shelves in the houses and were accessible to any visitor who, without fear of offending, might take a book to read. Gifts to the islanders were divided by the Chief Magistrate among all the families.

Murray (65, p. 134) reports that a general reserve supply of food and other articles was maintained by the community.

> There was, it seemed, besides private property, a sort of general stock, out of which articles were issued on account to the several members of the community, and. for mutual accommodations, exchanges of one kind of provision for another were very frequent as salt for fresh provisions, vegetables and fruit for poultry, fish etc., also, when the stores of one family were low, or wholly expended, a fresh supply was raised from another, or out of the general stock, to be repaid when circumstances were more favorable.

On Norfolk Island the land is divided into freehold and crown lease. Most of the freehold property is in the hands of the descendants of the families which migrated from Pitcairn. Each of the Pitcairn families on their arrival at Norfolk received a section of land which has since been inherited in the family. This land may be sold and prices of 5 to 10 pounds sterling an acre have been obtained. There is, however, a strong prejudice against selling land to outsiders who may wish to settle on Norfolk. The Crown land which consists for the most part of acreage formerly assigned to the Melanesian Mission may be leased in sections up to 25 acres for a period of 28 years, at a rental determined by the type of land acquired. The lessee must reside upon the leased property and cultivate a certain proportion of it. The number of outsiders who have taken up land under these conditions is very small. There is no common on Norfolk, nor any common property except public buildings and roads. The considerable freedom which existed on Pitcairn in regard to the use of articles of private property does not exist on Norfolk. Full individual ownership of real and of personal property is recognized.

GOVERNMENT

No published accounts of the mutineers explain how they regulated their domestic affairs. It seems, however, that during his lifetime Fletcher Christian was able to control the settlement, but that after his death turmoil and bloodshed prevailed. It is clear from what little is known that no formal code of laws governed the relationships of the members of the community. The world's first glimpse of the Pitcairn Islanders is through the eyes of Captain Folger (36) who relates that in 1808 the colony consisted of 35 people, including John Adams, the sole survivor of the mutineers. Adams was acknowledged as father and commander of them all and was the arbiter in all matters of dispute and guided the colony through all its difficulties. Staines (81) speaks of his exemplary conduct and fatherly care which gave him preeminence. Even in the regulation of marriage the advice of Adams was sought but not always followed. Although Adams frowned on early marriages, yet several marriages of girls at the age of 13 and 14 to youths of 16 and 17 are recorded during his regime. In a word, the government was patriarchal without a definite system and dependent on one man, John Adams. It was a practice never to let the sun descend on a quarrel. Some of the statements about the government of Pitcairn were written with a great deal of gusto and hyperbole, but there can be no doubt that internal matters were easily controlled and that there were no serious impediments to a smoothly moving society.

After the death of Adams in 1829 no chief or magistrate was elected, in spite of the expressed wish of Adams on his deathbed that a leader be chosen to govern the people. George Hunn Nobbs seems to have assumed a somewhat controlling place in the community but not with the entire accord of all the people. Matters remained in this unstable state until 1832 when Joshua Hill, an impostor of the rankest kind, landed on the island and peremptorily took over the government on the grounds that he had been sent out as Governor from England. For a period of five years he proved himself to be a despotic master, driving from the island the three Englishmen who had settled there with their wives, who were descendants of the mutineers, and their children. To support his authority four elders, three sub-elders and four cadets were appointed. It was not long before the people began to murmur against the harshness of his rule and write for relief, which finally came in 1837, when Hill was removed. An amusing sidelight on the character of Hill appears in a document quoted by Brodie in which Hill boasts of adventures with the famous and near-great, which in their obvious grotesque exaggeration were clearly fictitious.

Captain Elliott (33), who arrived at Pitcairn in 1838 describes the state of affairs as follows:

> I found this interesting community preserving their deservedly high character for exemplary morality, innocence, and integrity; but they very earnestly represented to me the immediate necessity for there being some chief,

or head, their increasing community (amounting now to ninety-nine souls), for their internal regulation and government; but more especially to meet the difficulties and dangers which they had already experienced, and were again threatened with, by lawless strangers in whale ships; there having been cases of recent occurrence, where half the ruffian crew of a whale ship were on shore for a fortnight, during which time, they offered every insult to the inhabitants, and threatened to violate any women whose protectors they could overcome by force, occasioning the necessary concentration of the men's strength for the personal protection of the females, and thereby great damage to their crops, which demanded their constant attention; taunting them that they had no laws, no country, no authority that they were to respect—American vessels denying that they were under the protection of Great Britain, as they had neither colours nor written authority. I found them, however, with a merchant union jack flying, procured from an English ship. Apprehending that my duty required some decided step in this unlooked for contingency, I considered I should best afford protection to these people, and least involve my own Government, of whose intention in respect to the Pitcairn islanders I am ignorant, by conferring the stamp of authority on their election of a magistrate or elder, to be periodically chosen from among themselves, and answerable for his proceedings to Her Majesty's Government, for whose information he is to keep a journal. I accordingly drew up a few hasty regulations, to be observed under my authority, in the election of this officer, marked No. 6; which, with a formal attestation of his being sworn before me, and a union jack, which I supplied them with, will, I trust, insure them from any renewed insults from foreigners. By their unanimous voice, they selected for the situation Edward Quintal, a most able and superior senior of their number. I trust, sir, you will consider my assumption of the power to confer this authority, was warranted by the urgency of circumstances and the difficulty of reference; and that you will be able to approve of the view I have taken of my duty.

Elliott quotes also the following: "Regulations for the appointment of a magistrate at Pitcairn's, on the first day of January, every year."

An elder or magistrate is to be elected by the free votes of every native born on the island, male or female, who shall have attained the age of eighteen years; or, of persons who have resided five years upon the island. And they shall assemble for such purpose in the schoolhouse the first day of every year, where the business shall be presided over by the magistrate of the preceding year, whose period of office does not expire until the swearing in of his successor. The greatest number of votes shall determine the election or re-election of the magistrate, whose duty it shall be to hold the chief authority on the island, and to settle all differences, with the advice of his council; which is to consist of two other natives, one to be named by the votes of the assembly, and the other by the magistrate himself; but his decision is final. It shall be the duty of the said magistrate, also, to keep a journal or register of all complaints made to him, and his decision on them; and if any grave offence, or serious crime, be committed, he is to secure the custody of the offender, until he has the opportunity of delivering him over to justice. He will submit his account of what has occurred to the captain of any British ship of war arriving; and hold himself responsible for the faithful and just fulfilment of the duties of his office. It will be incumbent on his countrymen, and the residents on the island, to respect his situation, and obey his authority, under pain of serious consequences, until he is superseded by the authority of Her Majesty the Queen of Great Britain. No one shall be eligible for the situation of magistrate, but a native-born inhabitant of the island. The following shall be the form of oath to be administered: "I solemnly swear, that I will execute the duties of magistrate and chief ruler of Pitcairn's Island, to which I am this day called on the election of the inhabitants, by dispensing justice and settling any differences that may arise, zealously, fearlessly, and impartially; and that I will keep a register of my proceedings, and hold myself accountable for the due exercise of my office to Her Majesty the Queen of Great Britain, or her Representatives. So help me God."

In addition there was a generally recognized code of laws in force by 1850. Brodie (15) quotes these in full. A public trial by jury was the prerogative of every islander. The duties of the chief magistrate were carefully detailed, and he was forbidden to overstep his legal authority. Provision was even made for a journal in which all events of public importance were recorded. It is apparent from the number of laws concerning timber and animals that these played an important part in the internal affairs of the island. With the gradual exhaustion of the hard timber, laws were enacted to prevent ruthless cutting and waste of trees which were slow in growing. Even the owner of valuable trees could not of his own will cut them. In the event of excess cutting by an individual, the extra lumber was available to whomever needed it. Laws and fines were established for infringement of fishing rights. Dogs, cats, hogs, and even chickens did not escape regulation.

School was compulsory for all children from the age of 6 to 16 (p. 25). The regular tuition was a shilling a month, but there was a series of equivalents: one barrel of yams was valued at 8 shillings; one barrel of sweet potatoes, 8 shillings; one barrel of Irish potatoes, 12 shillings; three good bunches of plantains, 4 shillings; and one day's labor, 2 shillings.

Trading with passing ships was of great importance and was consequently under strict supervision. For example, the sale or purchase of liquor was forbidden, and women were not allowed on board except when accompanied by the magistrate or his deputies.

Among the magistrate's duties was the annual inspection of landmarks and the overseeing of public works. Public works included the building of houses, fresh thatching, care of the church,

roads, and water tanks. For the execution of these public tasks one member of each family was drafted.

Property was carefully regulated. The land of each family was divided equally among the children, both male and female. On becoming married, an individual entered upon his inheritance of land.

It was customary to refer all disputes, which were not amicably settled by the magistrate and his council, to the first captain of a British man-of-war visiting the island after the dispute had occurred. From his decision there was no appeal. The first record of this practice dates from 1825, when Beechey relates that Polly Young "had incautiously said she would never marry George Adams, but who, with the advance of time had changed her mind but because of her original promise, still refused to marry the man."

Brodie avers that because of its onerous responsibilities, the office of magistrate was not coveted, although the encumbent was the recipient of many honors and the respect of the entire community.

Matters of community interest were always voted upon by the entire colony. Captain Freemantle (37), who arrived at Pitcairn in 1855 to remove the people to Norfolk, gives in the following passage a description of the method by which the group arrived at so momentous a decision as the migration to a new home.

> After having been heartily greeted by the whole population, we proceeded to the church and schoolhouse, the spot usually chosen for assembling the community upon public matters. Here the object of the mission was explained to them. . . . The generous proposal of Her Majesty's Government was not altogether unexpected; rumours of such intentions had already reached Pitcairn; and although the mind of the people generally was made up, they asked for a day or two for inquiry and consultation, before finally deciding on so grave a question.
>
> The following evening a general meeting of the community was held, and a very large majority at once closed with the offer which had been made. Some there were, however, whose attachment for Pitcairn was apparently too strong to reconcile themselves to the thoughts of abandoning it. Among these was George Adams, the son of old John Adams, of the Bounty. All felt the necessity of some change, for another subdivision of land would reduce the portions to mere insignificant patches scarcely worth cultivating. All felt most grateful for the solicitude and liberality manifested in their behalf by Her Majesty's Government, but the anticipated removal was a melancholy subject for deliberation; the addresses were very abrupt, and in some instances confined to the monosyllable "go." The discussion ended, however, by 153, out of a population of 187, declaring for Norfolk Island; the rest I will not say determined to remain on Pitcairn, but they would not then acquiesce to the voice of the majority. The lamentable migration to Tahiti in 1831, still fresh in the recollection of the older and more influential part of the community, no doubt prompted misgivings as to the present scheme. The final issue was conveyed in writing, signed by the magistrate and Chaplain of the island.

From the report of Rodwell (77) for 1921, it appears that the government on Pitcairn Island at the present day is in the hands of a Chief Magistrate, a Secretary to the Government, two Assessors or Elders, and an "Internal Committee" of three. These officers are elected annually by an open vote. The Chief Magistrate reports to the High Commissioner of the Western Pacific, who is an official of the British Government. Sir Cecil Rodwell reports that there is dissatisfaction over the present system of administration in that it is difficult to secure seven men out of a total population of about 170 who have the requisite ability and time to devote to carrying out of public business. The improvement suggested is that only three be chosen each year, the principal official to be the Chief Magistrate. It is added in the same report that there are few internal administrative problems. The most difficult is that arising out of illegitimate births, where the paternity cannot be established and the child becomes a public burden, unless arrangements can be made for adoption.

Norfolk Island is governed by an administrator appointed by the Commonwealth of Australia, of which the island is a Territory. The administrator serves also as Chief Magistrate and is responsible to the Minister for Home and Territories of Australia. Matters of judicial importance are handled by the administrator or by the administrator and a jury of seven Elders chosen from the islanders. There is also an Executive Council to which six members are elected and six chosen. Matters of internal and domestic interest such as public work, pasturage and improvements are the concern of this body, which is directly responsible to the administrator.

RELIGION

Religion was a prominent feature in the lives of the Pitcairn Islanders. Practically every visitor to Pitcairn dwells at length on the extremely religious character of the islanders, particularly some of the mid-Victorian writers on Pitcairn. The Rev. Thomas Boyles Murray (65) even wrote a book which was designed to serve as a

moral lesson of the beneficial effects of religion. The religious observances have been described with much detail by Brodie, Barrow, Shillibeer and Beechey. For present purposes a brief outline will suffice.

There is a great deal of vagueness about the beginning of religious observances on Pitcairn. The first instruction was received from Young and from John Adams. Traditionally Adams had several visions which pictured the fury of Hell so vividly that he was persuaded to bring about a change in the religious habits of the islanders. Accordingly he taught the young children prayers from the Church of England Prayer Book and read to them from the Bible which had been salvaged from the wreck of the *Bounty*. Having but little knowledge of religious practices, he went to the Prayer Book for guidance and finding there that Ash Wednesday and Good Friday were fast days, he interpreted it to mean that every Wednesday and Friday were to be observed by fasting. He therefore, established both these days, as fast days, until on his arrival in 1823 John Buffett corrected this error, but Adams nevertheless maintained every Friday as a fast day until his death.

The success of Adams' teaching is evident. Writing of an event which occurred in 1814, Barrow says:

> The astonishment of Staines and Pipon was great, when taking T. O. Christian and George Young below to eat, they both rose up, and one of them, placing his hands together in a posture of devotion, pronounced, distinctly and with emphasis, in a pleasing tone of voice, the words, "For what we are going to receive the Lord make us truly thankful."

Shillibeer (80, p. 85) writes:

> Before they began to eat; on their knees, and with hands uplifted did they implore permission to partake in peace what was set before them, and when they had eaten heartily, resuming their former attitude, offered a fervent prayer of thanksgiving for the indulgence they had just experienced. Our omission of this ceremony did not escape their notice, for Christian asked whether it was not customary with us also.

Beechey (6, pp. 69, 75, 88-90) gives an account of the religious practices in 1825:

> His [Adams'] reformation could not, perhaps, have taken place at a more propitious moment. Out of nineteen children upon the island, there were several between the ages of seven and nine years; who, had they been longer suffered to follow their own inclinations, might have acquired habits which would have been difficult if not impossible for Adams to eradicate. The moment was, therefore, most favourable for his design. . . . as it is convenient that all the party should finish their meal about the same time, in order that the one grace might serve for all, each made most of his time. In Pitcairn Island it is not deemed proper to touch even a bit of bread without a grace before and after it, and a person is accused of inconsistency if he leaves off and begins again. So strict is their observance of this form, that we do not know of any instance in which it has been forgotten. On one occasion I had engaged Adams in conversation, and he incautiously took the first mouthful without having said his grace; but before he swallowed it, he recollected himself, and feeling as if he had committed a crime, immediately put away what he had in his mouth, and commenced his prayer. . . . The duty of saying grace was performed by John Buffet, a recent settler among them, and their clergyman; but if he be not present, it fell upon the oldest of the company. . . . At sunset they assemble at prayers as before, first offering their orison and thanksgiving, and then chaunting hymns. After this follows their evening meal, and at an early hour, having again said prayers, and chaunted the evening hymn, they retire to rest; but before they sleep, each person again offers up a short prayer upon his bed. . . . The Sabbath day is devoted entirely to prayer, reading, and serious meditation. No boat is allowed to quit the shore, nor any work whatever to be done, cooking excepted, for which preparation is made the preceding evening. I attended the church on this day, and found the service well conducted; the prayers were read by Adams, and the lessons by Buffet, the service being preceeded by hymns. The greatest devotion was apparent in every individual, and in the children there was a seriousness unknown in the younger part of our communities at home. In the course of the Litany they prayed for their sovereign and all the royal family with much apparent loyalty and sincerity. Some family prayers, which were thought appropriate to their particular case, were added to the usual service; and Adams, fearful of leaving out any essential part, read in addition all those prayers which were intended only as substitutes for others. A sermon followed, which was very well delivered by Buffet; and lest any part of it should be forgotten or escape attention, it was read three times. The whole concluded with hymns, which were first sung by the grown people, and afterwards the children. The service thus performed was very long; but the neat and cleanly appearance of the congregation, the devotion that animated every countenance, and the innocence and simplicity of the little children, prevented the attendance from becoming wearisome. In about a half an hour afterwards we again assembled to prayers, and at sunset service was repeated; so that, with their morning and evening prayers, they may be said to have church five times on Sundays. Marriages and christenings are duly performed by Adams.

Adams performed the marriages with a ring which was used for all weddings. He did not favor wedlock for the men until they had reached the age of 20 years and for women 18. This regulation, however, was frequently not observed in the early days of the colony.

Barrow (2, p. 341) gives the following characteristic episode which occurred on the arrival of Captain Waldegrave in 1830:

> "I have brought you a clergyman," says the captain.
> "God bless you," issued from every mouth; "but is he come to stay with us?"

"No."

"You bad man, why not?"

"I can not spare him, he is the chaplain of my ship; but I have brought you clothes and other articles, which King George has sent you."

"But," says Kitty Quintal, "we want food for our souls." . . . .

Nobbs, who had taken over the duties of minister after his arrival, was taken to England in 1853 to receive instruction and to become ordained as a minister in the Church of England. He returned in 1854 and for the first time administered the Holy Sacrament to the islanders. He was listed as Chaplain of Pitcairn Island with a salary of 50 pounds sterling a year, which he received from the Society for the Propagation of the Gospel. The Church was capable of holding 200 people. Young (92, p. 97) states that for many years the islanders were called to church by a bugle which later was replaced by the firing of a musket. In 1844 a bell was given to the islanders by the men from the man-of-war *Basilisk*.

The Pitcairn Islanders belonged to the Church of England; but the descendants of the few families that returned to Pitcairn after the removal to Norfolk Island are Seventh Day Adventists and for a long time were visited regularly by the missionary ship of that society. Most of the present Norfolk Islanders belong to the Church of England, but Methodists and Seventh Day Adventists also are represented. The services of the Church of England (Low Church) are conducted by a minister sent from Australia; those of the Methodist Church by a local member of the congregation. The Church of England uses one of the old prison buildings and the chapel of the Melanesian Mission Station, which formerly maintained its headquarters on Norfolk Island. The Methodists have recently constructed a wooden building. Sunday schools for the children are maintained in all the churches.

MENTAL AND MORAL TRAITS

The conclusions of most of the observers of the psychology of the Pitcairn Islanders agree in all essential details. This unanimity of opinion atones in part for the superficiality of many of the observations which were based on very short visits. It is difficult to estimate to what extent the characteristics of the islanders were due to isolation and ignorance of the life and habits of thought of their guests. For example, many of the early visitors speak of the naïveté with which the islanders asked personal questions and the child-like curiosity displayed in objects new to them; a quality seen also in letters making requests for favors. Undoubtedly this simplicity and exhibition of interest may be due to their lack of acquaintance not only with the objects with which they were unfamiliar, but the social usages of Europeans.

The good humor, hospitality, and generosity of the islanders are proverbial and partake considerably of a Tahitian quality. They were even covetous of the pleasure of entertaining the captains of visiting ships, an honor which they enjoyed regularly in turn. For these occasions the best at the disposal of the host was produced even at great personal cost.

Their honesty was unquestioned and no supervision was considered necessary by captains trading with the islanders. Several observers remark that the men were not particularly industrious, a quality which perhaps they inherit from their Tahitian forbears, but it should be remembered that the climate and environment of Pitcairn were not conducive to prolonged effort.

The morality of the Pitcairn Islanders in the early days of the colony was far-famed and served many Victorian moralists as a text for the beneficial results of the teaching of religious precepts. The religious atmosphere on Pitcairn is curiously reminiscent of an emotional quality, which we associate with revivalism. Meetings for the discussion of personal religious experiences were a favorite practice. Many of the characteristics of the religious life are like those described by Ellis for the more fervent of the newly converted Tahitians.

Beechey says that the islanders were not fond of levity and did not appreciate irony, interpreting it in its literal sense. This is contradicted by later observers, who mention the fondness for play and sport among the young and even older members of the community. They were unquestionably fond of outdoor sports and activities and displayed an active spirit of play.

Most visitors to Pitcairn have rated the intelligence of the islanders very high. Many were impressed by the quality of the learning in the public school and by the ability of many of the people to recite extended passages from the Bible and from such classic poets as Milton and Shakespeare.

In observing the descendants of the mutineers on Norfolk Island, I tried to maintain an impartial point of view, but naturally my conclusions

are colored by my contacts, which were as diverse, however, as I could make them.

The old simplicity has disappeared to a very large extent through contact with the outside world, but there still remains a charm of manners which springs from a good humor and fondness for people. The hospitality of the people is bounteous and always freely given. A common characteristic is the love of company and parties. The frequent picnics, parties, and gatherings of all sorts are accompanied by a great deal of hilarity. Joking or chaffing is indulged in with high spirits. All this is part of the effervescent and laughter-loving character of the people, which is also characteristic of the Tahitians.

Norfolk Island men are not distinguished for their industry. The desire for hard work is absent in spite of the material rewards which labor gives. The men can and do perform physical feats which are laborious, but sustained work is not common. This attitude is perhaps natural in an island where crops are grown without much effort and where the natural products of the soil are abundant.

The Norfolk Islanders lack also a spirit of aggression, which is not physical or mental cowardice, but a disposition to take things as they come without a serious effort to remedy grievances. There have been exceptions to this.

The emotional quality of the Pitcairn Islanders is also found among the Norfolk Islanders, overlaid, however, by a greater sophistication. Men and women form affectionate attachments to people of whom they are fond, but I have the feeling that their emotions, although easily exhibited, are superficial in the sense that their intensity is not of long duration. Many experienced observers maintain that in spite of the apparent openness of manner of the Norfolk Islanders, it is impossible to gain their entire confidence; that a reserve is felt even after long acquaintance. This may be an exaggeration of a purely personal nature but among at least some of the islanders there is a manifest shyness in meeting strangers which I had to deal with in my field work. The children are especially shy in the presence of strangers.

The morality of the Norfolk Islanders has recently been criticized by various visitors. That there is some justification for this is certain, but the morality involves more than sex relationship. I do not believe that the unmarried are more immoral than the young men and women of many of the large cities of America and England and certainly, if immorality is measured by its sordidity, the Norfolk Islanders can not be said to be essentially an immoral people.

The intelligence of the islanders appeared to be not of a low order. As compared with the school children of equal age in Australia, the school master, himself an Australian, informed me that the Norfolk Island children did equally good work and were of equal intelligence. My impression from the adults is of a bright and intelligent people.

COMPARATIVE ANALYSIS OF ANTHROPOMETRIC CHARACTERS

METHOD AND MATERIAL

The present study of human inheritance of the descendants of the mutineers of the *Bounty* is based on material collected by me on Norfolk Island in 1923-24 as part of the general program of Bernice P. Bishop Museum for the study of racial problems in the Pacific. Observations and measurements were made on 150 individuals, of whom 64 were males; 49, females; and the rest, children, representing, roughly, about one-quarter of the population of Norfolk Island. The measurements were taken in the usual manner, following Martin (61). The instruments used were an anthropometer, a sliding and a spreading caliper, a steel tape, and von Luschan's color scale. The following measurements were taken:

Projection with the anthropometer:
- Stature
- Height of tragion
- Height of acromion
- Height of radiale
- Height of stylion
- Height of dactylion
- Height of tibiale
- Height of sphyrion
- Sitting height.

Direct measurements with the anthropometer:
- Span
- Bi-acromion width
- Chest width
- Chest depth
- Bi-iliac width (maximum distance of iliac crests).

Direct measurements with the sliding and spreading caliper:
- Maximum head length
- Maximum head width
- Face height (nasion—gnathion)
- Upper face height (nasion-prosthion)
- Maximum bizygomatic diameter
- Minimum frontal diameter
- Bigonial diameter
- Nose height
- Nose width

Ear height
Ear width
Maximum circumference of the head

Observations were taken on skin color, hair form, color, texture and distribution, eye color, fold and sclera, nose, lips, chin, forehead, profile and ears. Careful records were made of the teeth.

These measurements and observations are incorporated in tables I-LXIV (pp. 71-90). The individual records constitute tables LXV-LXX (pp. 91-95).

The comparative material on the Tahitians was obtained by Dr. E. S. Craighill Handy, in 1923, from all parts of the Society Islands. The series includes 85 males and 64 females, and represents a random sample of the population. The material for the English is profuse for such measurements as head length and head width, but pitifully scanty on other measurements on the head, face, and body. Fortunately, Hrdlička's (49) excellent study, the "Old Americans," was available. This work proved especially valuable when material was lacking for the English, for, as Hrdlička points out, the Old Americans are predominantly of English origin, with slight admixtures of other north European stocks. From a statistically unreduced series of British scientists measured by von Luschan (57), I derived the statistical constants. A small amount of comparative material was obtained from other sources.

The population of Norfolk Island are the descendants of the mutineers of the *Bounty*, and include most of the colony which formerly lived on Pitcairn Island. The present inhabitants of Pitcairn represent another group descended from the original mutineers. They are the descendants of a few families who, after the entire colony had been transferred to Norfolk in 1856, returned to their old home. This group is reported from various sources to be in a lamentable condition but Colquhoun (19), who visited Pitcairn in 1921, found no signs of physical degeneration; quite the reverse. Due, perhaps, to greatly intensified inbreeding on Pitcairn, or to selection, it appears that the two groups have diverged in certain respects. At least I found on Norfolk none of the marks of degeneracy which are said to be prevalent among the present Pitcairn Islanders.

Most of the Norfolk Islanders are of the fourth and fifth generation from the original cross between English and Tahitian. They have been thoroughly mixed and inbreeding has inevitably followed, as the initial crosses were few and the population small. I have treated the series as a typical F_2 sample, that is, the means of the Norfolk group have been compared with the English and the Society Islanders. It was not considered worth while to separate the group into divisions based on amount of English or Tahitian blood. Such a division would have considerably reduced the size of the series involved and, furthermore, experiments in grouping the material revealed no significant differences when divided on the basis of amount of English or Tahitian blood, except for a few individuals. For such a mixed group of long duration, the consideration of the group as a whole is believed to yield the best results.

Unfortunately, the conditions of field work made the collection of family data very difficult. I was able to obtain only a few complete family records, so that a study of family inheritance was impossible.

QUANTITATIVE AND QUALITATIVE MEASUREMENTS

Stature

It is clear from a study of Table I that the average stature of the Norfolk men surpasses that of both parent stocks, English and Tahitian. This superiority has been characteristic, apparently, of the descendants of the mutineers of the *Bounty* since the beginning. Waldegrave (88) in 1830 states that the men are from "five feet eight inches to six feet high." Beechey (6), a careful observer, had a surgeon on board the *Blossom,* who took various measurements of the islanders in 1825, and he writes, "their average height is five feet ten [177.8 cm.]; the tallest person is six feet one quarter inch; and the shortest of the adults is five feet nine and one eighth inches." Both these observations on the first generation born on Pitcairn from the English mutineers and Tahitian women are in close agreement. These F_1 hybrids possessed a stature markedly in excess of the average English and Tahitian stature. This increase of height among the hybrids is due to heterosis. The Norfolk Islanders, modern descendants of the Pitcairn Islanders, have a mean stature which is reduced from that of the F_1 generation, but which is still greater than that of the parent peoples.

The mean stature for Norfolk males as shown in Table I is 174.0 cm.; for those of the Society Islands, 171.35 cm. Among Polynesian groups

related to the Society Islanders, Sullivan (83) gives for the Tongans a mean of 173.0 cm.; for Samoans, 171.7 cm.; and Marquesans, 170.3 cm. Dunn (31) gives as the average stature for Hawaiians 171.3 cm. These means do not differ materially from the Society mean. Two very small series of Society Islanders measured by ten Kate (86) and by Gros (43) give the means 172.8 and 172.4, respectively, but these are less useful for comparative purposes than the Society Islands series measured by Handy (44). The Norfolk group exceed the Society Island series by 2.65 cm., a difference which is significant.

Although the English are a tall people, nevertheless, the average stature of unselected English groups is less than the Norfolk mean. Even if 172.0 cm. be taken as representing the height of all Englishmen, a mean which is liberal if the socially selected groups such as the Oxford and Cambridge undergraduates and British scientists are disregarded, the Norfolk males remain taller. The only English series which produces a mean significantly greater than that of the Norfolk series, is the group of Oxford undergraduates, who unquestionably belong, for the most part, to a socially selected class and are unsuited, therefore, for racial comparison. It is interesting to note how closely the mean for British Scientists as reported by von Luschan (57) falls to the mean for Norfolk Islanders. The six mutineers who left progeny on Pitcairn average 170.6 cm.; although this figure is 3.4 cm. lower than the Norfolk average, its significance is obscured by the high probable error.

Unlike the men, the Norfolk Island women do not exhibit any superiority to the parent stocks in stature. Averages for other Polynesian women are in close agreement. The series of Old American women yields a mean of 161.83 cm., which is practically identical with the Norfolk mean. Von Luschan's series of British women is apparently taller than the hybrid women, but the mean is derived from only 11 women with a consequently high probable error. (See fig. 1, p. 65.)

Sitting Height

From the fact that the Norfolk Islanders exceed their parent stocks in stature, it might be expected that the Norfolk group would be superior in sitting height. This is found to be true upon comparing the hybrids with the Society Islanders. The mean for the Norfolk men is 91.93 cm., as against 89.40 cm., for Society Islanders. The series of 14 Society Island men studied by ten Kate yielded an average of 88.21 cm. The difference between the hybrids and English is not so striking. Davenport's (28) means for American soldiers, English and Scotch, and Bean's (4) mean for Americans, are all significantly less than the Norfolk average. The Old Americans are almost identical in mean sitting height with the Norfolk hybrids, as they were in stature. The English professional classes (76) and Galton's (40) series of English are not appreciably different from the Norfolk men. As in total height, so in sitting height, the Oxford undergraduates are superior to the hybrids.

The position of the Norfolk women in regard to sitting height is different from that of the men (Table II). The average for the hybrid women is 85.66 cm., which is midway between the mean of 87.27 cm. for Old American women and 83.88 cm. for the Society Islands women. For 11 women from the Society Islands ten Kate found a mean of 81.74 cm. The intermediate position of the Norfolk women is statistically real, as the differences from both English and Society Islanders exceed three times the probable errors. (See fig. 2, p. 65.)

Maximum Head Length

There is clearly a racial difference between the average head length of the Society Islanders and the English. The disparity is approximately 6 to 8 mm. and is unquestionably of great importance in the study of inheritance. The largest mean head length of the three Society Island groups listed in Table III is ten Kate's series of 14 males, which yields an average of 191 mm. This, however, does not reach to the lower range of the English means represented by 192.45 mm., for Convicts. With a striking mean difference and without overlapping of the means, it is justifiable to consider this dimension as sharply divergent in the parent stocks. The question of artificial deformation of the head should be discussed in connection with the head length. Sullivan (85) writes in connection with his study of the Tongans:

> At my request inquiries were made by Gifford and McKern as to the prevalence and methods of head deformation. The information shows that the Tongans in the past and to some extent at the present time, shape the heads of the children, but the description of the methods employed throws no light on the deformation seen in the crania. According to several informants, the child was laid on a piece of tapa with the top of

its head placed against a heavy block of squared wood, the pressure tending to flatten the top of the cranium. The deformation described above is decidedly not of this type. Since the procedure is said to have been continued for one month only, its effect may be considered as negligible. It is difficult to understand how it would have any appreciable effect even if continued indefinitely, since the amount of pressure involved, must have been very slight.

Sullivan observed in six ancient Tongan skulls a moderate to pronounced occipital flattening accompanied by marked asymmetry, which he believes was produced by artificial deformation. He suggests the hard beds and wooden pillows used by the Polynesians as a possible explanation for the deformation. The modern Tongan heads do not exhibit this deformation as strikingly as the ancient crania. It is difficult to see why the hard beds and wooden pillows of the modern Tongans have not deformed the heads as much as similar bedding habits affected the skulls of the ancients. Marquesans, as well as Hawaiians, according to Sullivan (83) massage the head of the child to produce a desired shape. There is said to be a similar flattening of the occiput of the Society Islanders. Huguenin (50) writes:

Le crâne est brachycéphale, autant que nous pouvons en juger de visu, sans avoir pris de mesures. L'os occipital est fréquemment aplati.

Je ne crois pas que ce soit la une déformation crânienne, bien que l'habitude de coucher sur une simple natte ou sur un petit tabouret pose sur le sol ou sur les planches puisse contribuer à cet aplatissement de l'occipital.

It seems to me that the occipital flattening found among modern Polynesians, has been stressed too much as the result of some form of artificial deformation. In many skulls the flattening is not confined to the extreme occiput, where it logically should be if the Polynesian type of bed were its cause; it is found on parts of the skull which do not come in contact with the floor or wooden pillow. Also the intermittent massage of children's heads by mothers, is of doubtful efficacy in modelling the skull. Furthermore, the identical type of flattened occiput as described for pure Polynesians occurs occasionally among the hybrids of Norfolk Island, where there is no massaging of the children's heads nor wooden pillows; the bedding of the Norfolk Islanders is the same as that used by Americans.

A study of Table III will reveal how clearly the Norfolk men have inherited the English head length. The English groups listed in Table III vary from 192.45 mm. to 198.8 mm. It will be noted that the mean, 195.59, for the hybrids, is approximately midway between the extreme limits of English variation. The Society Islands groups are definitely shorter headed than the Norfolk men. In none of the other Polynesian groups does the mean approximate that for the English.

The Samoans and Tongans are slightly longer headed than the Society Islanders, but the Hawaiians are very much shorter headed. The figures for mean head length are: Samoans, 190.6 mm.; Tongans, 191.0 mm.; Hawaiians, 182.42 mm.

It is well established that within a group, head length increases with stature. Fortunately the stature of the Society Islanders and the English is very similar, so that the difference between these two stocks in head length is not obscured by dissimilar heights. Although the Norfolk Islanders are taller than either of the parent stocks, the discrepancy is not great enough to invalidate the conclusions based on the approximation of the Norfolk Islanders to the English mean for maximum head length.

Norfolk women have an average head length of 185.61 mm. which is considerably greater than the mean head length of Society Islands women. The Society series of women yields a mean of 178.85 mm. while ten Kate for 11 women, finds an average of 179.0 mm. Other Polynesian women are longer headed than the Society Islands females. Tongan women have an average head length of 184.1 mm. and Samoan women, 183.0 mm. The Norfolk women do not differ significantly from Old American women, but the mean of eleven British women, 188.55 mm., exceeds the Norfolk mean. The significance of this excess is diminished by the inadequacy of the series as well as the greater concomitant stature of the British women. (See fig. 3, p. 65.)

Maximum Head Width

As in head length, the parent stocks, English and Society Islanders, are clearly divergent in maximum head width. The English groups given in Table IV have an average head width ranging from 151 mm. to 155 mm. The wider-headed English groups are selected samples and are probably above the racial mean. I have calculated the average of 52 modern groups of British totaling 8527 individuals, from means listed by Parsons (71). The mean obtained is 151.43. Therefore, it seems clear that if 152-153 mm. is taken as representing the racial average of the English,

an approximate English average will be reached which minimizes rather than exaggerates the difference between the English and Tahitians. The Society Islanders are best represented by the series of 85 males measured by Handy (44). This average is 159.58. Ten Kate gives 161.9 as the average of 14 individuals, which is slightly greater than my mean but this is expected since the mean head length and stature of ten Kate's group are consistently greater than my means for Society Islanders. Gros's series yields an average of 152.4 mm. for head width, but this is probably too small in the face of the very much larger means for Handy's and ten Kate's series.

The difference then for head width between the English and Society Islanders is about 6 or 7 mm. The Norfolk Islanders have an average head width of 155.47 mm., which is intermediate in position, but is nearer the English than the Society Islands type.

A divergence similar to that between Society Islands men and English men for head width exists among the women of these stocks. The Old American women average 148.0 mm., and 11 British women, 149.0 mm. The Society series, based on 68 individuals, gives a mean head width of 154.13 mm., while ten Kate's series of 11 women yields 152.7 as an average.

The Norfolk women with a mean of 150.61 mm., are intermediate, but slightly closer to the English group. The hybrid women are not significantly wider-headed than the group of British women measured by von Luschan, but there is an actual difference of statistical significance between the Norfolk women and the series of Old American women. (See fig. 4, p. 65.)

Head Circumference

The horizontal head circumference is a rough indication of the size of the head where the parent stocks are different in this respect. Unfortunately, the data procurable on this measurement are extremely scanty, not only for the Tahitians, where voluminous material in other anthropometric measurements is lacking, but also for the English, for whom there is a wealth of material on the head length and breadth and corresponding diameters on the face, but an unaccountable paucity of data on other equally interesting measurements on the head and face. My conception of the horizontal head circumference of the Society Islanders is based on the average obtained by Gros for only six individuals. The English data are from the series of Scientists, from which I derived the statistical constants, and the excellent series of Convicts given by Goring. The hybrids have a mean horizontal head circumference of 565.17 mm., which is not appreciably different from the mean for Gros's average—563.3 mm.—for six Society Islanders. The mean 573.7 mm. for the British series, is significantly greater than the Norfolk average, but it is not at all evident that the Scientists represent the English mean, as the head diameters of this group, which is a selected one, are greater than the means of the more nearly representative English groups. The mean for the Convicts, 559.72 mm., is however, lower than the hybrid mean. Therefore, regarding the von Luschan series as slightly above and Goring's as slightly below the English mean, it would appear that there is little difference between either the parent stocks, or between the hybrid and the English or Tahitian.

The comparative material for females is altogether inadequate for an estimation of the relative position of the hybrid women. The only head circumference for a Society Islands woman I was able to procure, is a single individual measured by Gros. This is patently insufficient evidence. This single Society female had a head circumference of 538.0 mm. The mean for the hybrid women is 555.22 mm., which is in fairly close accord with the average of five British women who gave the mean of 553.2.

Maximum Bizygomatic Diameter

Compared with the Tahitians, the English have a narrow face. The mean for the Society Islands men is 145.72 mm.; ten Kate's series has an average of 147.1 mm., and Gros's ten Tahitians give a mean of 140.0 mm. The mean of 145.72 mm., representing the series of Society Islands men, is probably nearest the true average. Gros's series are too low and are consistent with the low means for other measurements. Ten Kate's group is slightly high. The Society Islanders are very close to the mean face width—145.9 mm.—for the Samoans. Tongans average 143.5 and Hawaiians 140.19 mm. The English average, judging from the available means listed in Table VI, is 138-139 mm. for face width. The Whitechapel and Moorfields means, 138.05 mm. and 137.00 mm., respectively, may be slightly low, since I obtained these averages by adding, according to Keith, 8 mm. to the mean obtained on skulls. The same allowance was made for the thickness of the soft

parts on the forehead, but it is obvious that the soft parts of the cheeks at the level of the zygomata, are thicker than at the minimum frontal diameter. The average obtained from von Luschan's data for Scientists is in all probability higher than the normal, since the mean for head width also was above the average for English groups. The mean for the hybrid males is 140.88 mm., which significantly is less than the face width for the Society Islanders. However, the difference from the English is only a slight but perhaps significant one. The Scientists are not appreciably narrower-faced, although the other means listed in Table VI are all just beyond the range of three times the probable error of the difference. Thus it is apparent that the hybrid males occupy the same position for face width, as in head width; that is to say, approximating the English average, although slightly greater and yet significantly less than that of the Society Islanders.

The position of the Norfolk women is more intermediate for face width than is that of the males. The mean for the hybrid females is 133.98 mm., which is 4.96 mm. less than the mean for the Society Islands women. This is a difference of real significance. Ten Kate's series yields an average of 136.5 and Tongans 136.1 mm. With the exception of the 11 British women, the Norfolk mean is as divergent from the English as from the Society Islands mean. The mean for Old Americans is 129.9; Whitechapel, 128.27; and Moorfields, 130.0 mm. The British women mentioned above yield an average of 131.45 mm., but although this mean is only slightly greater than the other English means, nevertheless, because of the few persons in the group, the probable error is so large that it vitiates legitimate differences. Thus it is seen that the Norfolk women are practically midway for face width, between the wide-faced Tahitian women and the narrower-faced English.

Face Height

Face height (nasion to menton) is a measurement open to a rather large personal equation due to the fact that the precise location of nasion is difficult, especially for the untrained field worker. It is possible under favorable conditions to determine nasion with a certain amount of accuracy, but in the majority of cases, palpation may not be successful. Sullivan (83) in his study of the Marquesans, was aware of this difficulty and points out that personal differences in locating nasion may vary to a large extent. Bearing this in mind, a more than usual difference between two means should be required to consider it significant. The mean for the Society Islanders is 124.78 mm., the mean for Marquesans is 124.1 mm., while the means for Samoans and Tongans are, respectively, 131.1 mm. and 128.2 mm. for face height. This discrepancy may be the result of personal equation in determining nasion. The average for the Hawaiians is 122.72 mm., which adds further vexation in attempting to arrive at the Polynesian face height. There are unquestionably strong island differences, but it seems that they have been exaggerated by differing techniques. Goring's mean of 123.73 mm. for Convicts agrees fairly well with the average, 124.77 mm., obtained by me from von Luschan's data on Scientists. Both these English means are close to the Tahitian, but the mean of Hrdlička's series of Old Americans (121.8 mm.) is appreciably lower than either the English or Society Islands means. The hybrids have the mean face height of 125.30 mm., which is not significantly different from the Society Islands or the Scientists mean. The hybrids are, however, significantly longer faced than both the Convicts and Old Americans.

The face of the English women is considerably shorter than the Tahitian type. The mean for Society Islands women is 118.47 mm. as contrasted with 113.82 mm. for the British series and 110.9 mm. for Old American women (Table VII). The face height for Samoan women is 121.1 mm., for Tongans 124.1, and Marquesans 114.5. The hybrid women, unlike the Norfolk men, are intermediate between the parent stocks. The average (115.51) for Norfolk women is significantly less than the mean for the Society Islands females, and is considerably greater than the face height for Old American women. But it must be remembered that the difficulty of finding nasion applies equally to this conclusion. (See fig. 7, p. 66.)

Minimum Frontal Diameter

The character of the Polynesian forehead found among the Society Islanders is striking. Its salient feature is the narrowness in relation to the face and head width. Keith (53) writes: "A narrow forehead is a Tahitian rather than a European feature." The Tahitian may have a high or low forehead, but it is one which is very often clearly defined by the temporal crests which flare out sharply to meet a pronounced brow ridge. The forehead in profile tends often to

the vertical but a retreating brow is not uncommon. Huguenin (50) describes the Tahitian forehead in the following:

> Comme le frontal est généralement bas, le crâne affect souvent la forme d'un pain du sucre. Le front n'est cependant pas fuyant; il est vertical et denote de l'intelligence. Les arcades sourcilières sont bien marquée.

Speaking of another type with Malay admixture found among the Tahitians, he writes that in this type, the forehead is "plus fuyant." Commonly, among the Society Islanders with low foreheads, the hair encroaches anteriorly on the temples and approaches the outer corner of the brow ridge.

It is at once evident from a study of Table VIII that the parent stocks differ widely. The Polynesian means are all low. The average minimum frontal diameter for Society Islanders is 102.93 mm. and 102.6 mm. for Gros's series. The Samoan mean is 103.4 and Tongan 104.8, which are slightly greater than the Tahitian mean. On the other hand, the English means are higher. The Laboratory series of Old American men yields a mean of 105.9 mm. The Whitechapel and Moorfields series are two groups of seventeenth century Londoners. Their means were obtained by adding to the mean of the skull measurements 8 mm., according to Keith (53). The means thus obtained, to make them comparable with living, are only slightly higher than the Old American average. The series of Scientists, however, are very much greater than the other English means. This difference is not entirely accounted for by the fact that the average head width of the Scientists is greater than the average for English groups. Undoubtedly the Scientists mean is too high, but the fact remains that the difference between the parent stocks is a real one. The hybrid males average 104.0 mm., which is nearer the Society Islands mean than the English The hybrids differ from the English significantly, but they are not significantly different from the Society Islanders.

The English and Society Islands women are less clearly differentiated than are the men for minimum frontal diameter. Among Polynesians, the mean for Society Islands women is 101.43 mm., which is the same as the Samoan average —101.5 mm., but less than that for the Tongan women—103.0 mm. This average for Tahitian women is not significantly different from the mean for 210 Old American women. By adding 8 mm. to the mean for the skull measurement I obtained 101.12 mm. and 103.16 mm. for Whitechapel and Moorfields women, respectively. These reconstructed means may be too great since, although Keith estimates 8 mm. for males as the thickness of the soft parts involved in this measurement, there is probably a sex difference in the thickness of the tissues at this point. The Whitechapel average does not differ from the Society Islands mean, although the Moorfields mean is larger to a slight extent. The mean for British women given by von Luschan is 108.36 mm., which is very much larger than the other English means. It will be remembered that the average for British Scientists was also excessive. But the scantiness of the series gives additional justification for not placing too much stress, for comparative purposes, on its mean value. It may be concluded, therefore, that there is practically no difference, or at least only a slight discrepancy between the English and Society Islands women. The Norfolk women, as would be expected, in this respect do not vary significantly from either parent group. The mean for the hybrid women is 102.82 mm., which is not noteworthily higher than the Society Islands mean nor lower than the Moorfields average, although the Whitechapel and Old American women are slightly narrower for the minimum frontal diameter. (See fig. 5, p. 66.)

Bigonial Diameter

Some observers have described the Polynesian type face as being particularly massive, not only in the width of the upper part of the face, but also across the lower part of the face, at the level of the gonial angles. This descriptive detail is not borne out for the Society Islanders in comparison with the English, who have bigonial diameters as wide as the Society Islanders. Among Polynesians, the Society Islands mean for bigonial diameter is 107.76 mm. The two small supplementary series of Gros and ten Kate (Table IX) have the averages 104.8 mm. and 109.3 mm., respectively. Sullivan gives the following means for other Polynesian groups: 104.6 mm., Samoan; 104.8 mm., Tongan; 109.5 mm., Marquesan. For the English, unfortunately, I have been able to collect only two series. The Laboratory group has a mean bigonial diameter of 106.3 mm. and the Scientists yields a mean of 108.02 mm. The Old American average is perhaps significantly smaller than the Society Islands,

but only slightly. No real difference, however, exists between the Scientists and the Society Islanders for bigonial diameter, although it must be remembered that this similarity may be misrepresenting the English approximation to the Society series, since the Scientists have not only wider heads, but also greater bizygomatic diameters than the average for the unselected English. These consistently greater breadth diameters for the Scientists would lead to the conclusion that the bigonial diameter as represented by this series, is slightly higher than the mean for the English. Keith (53) says: "In modern English skulls the mean bigonial width is a fraction over 99 mm. When covered by soft parts the same width is about 108 mm., allowing 9 mm. for the increase caused by the flesh." It may be assumed then, that no real difference exists between the English and Society Islanders. The Norfolk Islanders have, in relation to their parent stocks, a bigonial diameter such as would be expected where the parents' stocks are not significantly divergent. The mean for the hybrids is 107.64 mm., which is the same as the Society Islands mean and the Scientist average.

Society Islands females average for bigonial diameter, 102.6 mm. Ten Kate gives 99.4 mm. as the mean for 11 Society Islands women. Old American women have a mean bigonial diameter of 98.4 mm., which is significantly lower than the Society series of women, but which is not when compared with the mean of ten Kate's group. The Samoan mean of 99.0 mm. and the Tongan of 99.2 mm. are considerably less than that of the Society group, while the Marquesans with a mean of 103.0 mm., are about the same. The British women average 101.09 mm., but the probable error is large, so that it does not appear that this group really differs from the Society Islands mean. The hybrid females have a mean of 102.22 mm., which is very close to the Society Islands average, as well as the mean for the British women, but the difference from Hrdlička's mean is probably significant. Thus it is clear, from a consideration of these averages, that the female hybrids are in the same relative position as the males, similar to the Society and the Scientists means, but greater than the Old American average. (See fig. 6, p. 66.)

Nose Height

The technical difficulty mentioned when the face height was under discussion applies equally to the nasal height. The location of nasion by various observers varies by an appreciable amount, which naturally not only affects the mean for the nose height, but also influences the nasal index. Due perhaps more to this personal equation than to any inherent difference between the related groups, a rather wide range of mean differences is produced which obscures the inheritance of the hybrid group.

The Polynesians vary from about 51 mm. to 60 mm. The Society Islands mean nose height is 54.21 mm. The two additional groups of Society Islanders have a mean of 51.2 (ten Kate), and 52.5 (Gros). (Table X). The English means vary considerably also. British Scientists have a mean nasal height of 56.30 mm., which is appreciably greater than the mean for 85 Society Islanders. On the other hand, the Old Americans average 53.21 mm., but larger than the means of the small series of Gros and ten Kate. As there is no way of estimating the personal equation involved in taking the nose height, it cannot be taken into account statistically, but from a consideration of the mean values alone, there does not seem to be clear evidence that the English differ actually from the Society Islanders in nasal height. In the hybrid group the mean nose height is 55.38 mm., which is only just beyond the range of three times the probable error of the difference between the mean of the Norfolk group and that of Society and Old Americans groups, but it is, however, within this range, with respect to the Scientists. Although these differences might be accepted as valid, caution should be exercised in accepting this obvious conclusion, since it is evident that a wide margin of error must be allowed to eliminate the factor of the inaccurate location of nasion.

The Norfolk women (Table X) have a mean nose height of 52.27 mm., which agrees closely with the Society Islands mean of 52.12 mm., based on 68 women and the average of 52.55 mm. derived from 11 British females. Ten Kate's group yields a mean of 46.4 mm., which is very much lower than the mean for Society Islands women. Samoan women have a mean nose height of 54.3 mm., Tongan 56.7 mm., both of which are higher than the Society average, while the Marquesan mean of 48.6 is lower. On the other hand, Hrdlička gives 49.4 as the mean for Old American women, a figure, which from a statistical point of

view, is significantly lower than the mean for British women.

Nose Width

The results of a comparison of the nose width are more determinate than were those for the nose height. Both parent stocks have less mean variation but greater difference between the two stocks. The Society mean nose width is 43.4 mm., which agrees closely with the Samoan average of 43.8 mm., the Tongan of 44.4 mm., the Marquesan of 43.2 mm., and the Hawaiian of 44.2 mm. In the face of this evident similarity for these Polynesian groups, the means of ten Kate and Gros—40.9 mm. and 36.9 mm.—for Society Islanders become less valid as mean values. The English means also are in close agreement for nasal width, the mean difference being less than 1 mm. It is clear that the difference between the two stocks is at least 8 mm. The Norfolk males have a mean nose width of 37.56 mm., which is significantly lower than the Society mean, the difference being about 6 mm. The hybrids are also appreciably wider-nosed than the English, in whom the divergence is only about 2 mm., but the difference is not so great as between the hybrids and the Society Islanders. Evidently, the hybrids, while occupying a significant position, approach more closely the English than the Society Islanders.

The nose width among the Polynesian female groups is in as close agreement for their mean values as among the males (Table XI). The Society mean nose width is 39.97 mm., which is only slightly lower than the Samoan mean of 41.2 mm., the Tongan of 41.9 mm., and the Marquesan of 40.4 mm. The mean of 11 Society Islands females—35.7 mm.—is probably too small as a result of an insufficient sample. The two means listed in Table XI to represent the English mean are in very much the same agreement. Old American women average 32.5 mm., and British women 32.82 mm. The difference between the English women and Society Islands women is probably 7 mm. Like the males, the women of Norfolk Island have a mean nose width intermediate between the means of the parent stocks. The average for the hybrid women is 34.76 mm., which is fully 5 mm. less than the Society Islands mean nose width, a noteworthy difference. Although the hybrid mean approaches the English more closely than the Society mean, the Norfolk women are significantly broader-nosed than the English, the difference being 2 mm.

Relative Sitting Height

Although the sitting height is an important and frequently taken measurement, it may be misinterpreted, unless the stature is taken into consideration. For example, a short-statured long-bodied people may conceivably have a mean sitting height equal to that of a short-bodied tall group—a similarity which is misleading unless the total stature is also considered. The relative sitting height which measures the proportion of the sitting height to the stature is obtained by dividing the stature into the sitting height multiplied by 100 $\left(\frac{\text{S. H.} \times 100}{\text{Stature}}\right)$. It is well known that the sitting height index decreases with the increase of stature within the group, but this correlation differs in various groups.

The mean relative sitting height for the hybrid males is 52.81. This is significantly greater than the mean (52.18) for Society Islanders. Ten Kate's series gives an average of 51.05. The mean for Marquesans given by Sullivan (83) is 51.2. Dunn (30) finds a mean of 52.61 for Hawaiians. The Norfolk Islanders do not differ materially from the English, who range from 52.4 to 53.02. (See Table XII.) Since there is a correlation between stature and relative sitting height, it is natural to expect that if the mean stature of the hybrids were reduced to the English average, the hybrids would have a slightly higher sitting height index. This hypothetical increase would accentuate the difference already existing between the Norfolk Islanders and the Society Islanders, but would not, in all probability, exceed the mean range of the English groups.

The hybrid women have a mean relative sitting height of 53.16, which is higher than the corresponding index for males. Although, as has been seen, the Society Islands and Norfolk women are similar in stature, the Society Islands women possess a mean relative sitting height of 52.46, which is significantly lower than the average for the hybrid women. The mean for ten Kate's group of Society Islands women is 51.38. Marquesan women average 52.6. The Old American women, whose mean stature is exactly the same as that for the Norfolk women, nevertheless have a mean relative sitting height, 53.92, which is actually higher. It is clear that the Norfolk women occupy an intermediate position with respect to the parent stocks as they did in absolute sitting height.

Cephalic Index

The cephalic index has for a long time been used by anthropologists, but its validity as a single criterion of race has been overstressed, resulting in a sceptism on the part of many as to its value. But since the first concern here is not so much a determination of race, as a study of the inheritance of the hybrids sprung from two fairly divergent stocks, I shall not discuss the cephalic index as a racial character. Fortunately, I am able to do for the cephalic index what has not been possible for any of the previously discussed characters, that is to make a survey of its stability within a group. There are voluminous series of cephalic indices for the British people, some of the most important of which are listed in Table XIII. Unlike laboratory experimentation, a control cannot be maintained, nor is it possible to measure accurately every factor which enters into a problem such as this. But though the massing of statistics does not palliate a deficiency of accurate knowledge of all the factors involved, nevertheless, it is necessary to make the best of what data exist. Parsons (71) has listed a great many groups in Great Britain, dating from neolithic long barrow skulls to modern living people. (See Table XIV.) He professes to see an increase in the breadth of the English head, with a consequent tendency toward brachycephaly. For this supposed change in the head form of the British, he mentions two possible explanations: some change in environment which has only lately become active, and an influx of round-head Europeans during the last two centuries. Parsons favors immigration as the cause for this alleged change. Boas (13) found that the cephalic index of the children of immigrants into the United States differs from that of the parents and that stature also has changed. From Boas's data there is evidence that with an increase of stature there is a correlated increase in head length. Therefore, where stature increased a lowering in cephalic index might be expected. There is no proof that the mean English stature has decreased to produce a more brachycephalic head; rather, the stature of the British probably has increased with improved economic conditions. If the change in cephalic index in Great Britain be assigned to the relatively recent accession of blood from continental Europe, the apparent early initiation of this modification must be explained on a different basis. It seems to me that in all this discussion a relatively simple point has been overlooked, namely, the fact that brachycephaly is not a new thing in England. Parsons lists (Table XIV) the Bronze Age Beaker Folk with an average index of 83.0-85.5, and the fourteenth and fifteenth century crania from Hythe with an index of 81.2, both indices well above the English mean. The early series are very small and not nearly so representative of the total population as are the larger modern series consisting of very divergent and scattered groups, which includes brachycephals, who, though probably existent in medieval times are not represented in the meager series. There is also the fact to be remembered that many of the recent series listed are well within the range of the very early groups. It appears then far from proven that the cephalic index has changed to the degree suggested by Parsons. But even if such change has occurred, it is not sufficiently large to bring any of the English groups within the range of the Society Islanders. Its only bearing would be on the relative position the Norfolk Islanders hold with respect to their English progenitors.

As for the Society Islanders, the material is very scanty. The cranial material that exists and has been subjected to craniometric treatment would lead to the supposition that the head shape of the ancient population of the Society Islands was radically different from that of the present day population. There is no date assigned to any of the skulls measured, except the inference that they are ancient. Much of the cranial material is well within the limits of dolichocephaly, while all the material obtained on the living gives results which are universally brachycephalic. There is no material of which I am aware, which gives an idea what the eighteenth century Society Islander was like. But there seems to be no doubt that the ancient cranial type represented a group which is no longer characteristic of the islands, and has not been since historic times.

As found today, the inhabitants of the Society Islands in all probability are essentially as they were in Bligh's day. I have already discussed the possibility of cranial deformation. (See p. 35.) The cephalic index of the Society Islanders, as measured by Handy, Gros, and ten Kate, places them well in the brachycephalic group. The mean for 85 Society Islands males is 84.96; Gros gives 86.71; and ten Kate, 84.5. Samoans have a mean index of 81.3; Tongans, 81.1; and Marquesans, 79.4. The modern English, Scotch, and Amer-

icans of English ancestry vary from 77.46 to 79.0. Accepting Parsons' conclusion that the index for the English has changed, the approximate index for the late eighteenth century mutineers of the *Bounty* may be given as about 76-77. The Norfolk Islanders have a mean cephalic index of 79.54, which is higher than the English means. But the hybrid mean is nearer to the English than to the Society Islands mean of 84.96. This mean for the descendants of the mutineers of the *Bounty* would stand closer to a mid-position, if the hypothesis that the eighteenth century mutineers were in all probability more dolichocephalic than the modern English be accepted. The more brachycephalic head of the Norfolk Islanders, compared with the English, is due to the fact that although the English head length is inherited, nevertheless, the head breadth is midway between that of the English and the Society Islanders.

Approximately the same difference between the males in cephalic index exists also for the females of the Society Islands and for English women. The Society series of females averages 86.21. Ten Kate found an average of 85.0. These Society means are appreciably above the mean cephalic index for related Polynesian groups. Samoan women have a mean of 80.8; Tongan, 81.6; and Marquesan, 82.0. The English average is represented by the series of British women, who have a mean cephalic index of 79.09, and Old American women with an average of 79.4. There is evidently a marked difference between the two groups, English and Society. The hybrid women have a mean of 81.16, which is significantly lower than the Society mean and higher than the English, but relatively it is much nearer the English average. (See fig. 8, p. 66.)

Facial Index

Unfortunately, the facial index partakes of the same lack of precision as the face height, since this dimension is an element in the proportion. The sources of error which make the face height a difficult measurement, and one into which a large personal equation enters have already been reviewed (p. 37). It is obvious then that the index will have an element of doubt in the same ratio as the facial height. Nevertheless, since the index is highly descriptive, it is worth while to consider it.

The mean face index of the Society Islanders is 85.73. This is considerably lower than the means for the Samoans and Tongans, who have the means 89.9 and 89.2, respectively. The Marquesans, however, approach the Society Islands average more closely with a mean of 87.0. This difference in facial indices between the Samoans and Tongans, on the one hand, and the Society Islanders and Marquesans on the other, is probably in part due to the difference in technique and partly to an island difference. Scientists have an average of 89.17, which is significantly larger than the Society mean, but which does not differ appreciably from the Samoan and Tongan means. The index (89.98) for Convicts was obtained from the mean measurements. Goring (42) defines nasion as "the angle between the nose and the forehead," which is a loose determination of this difficult point, and, therefore, opens the mean face height of his series of Convicts to suspicion. The mean for Old Americans is 87.6, and for 20 English subjects measured by Hrdlička, 88.1 Accepting the Society mean as representing the average Society Islander, it seems that there is a significant difference between the two stocks amounting to 2-4 units. In other words, the Society Islanders are wider-faced in proportion to the face length than are the English. The mean facial index for the Norfolk Islanders is 89.13, an index which is very close to the averages for the Scientists and the Convicts. This is explained by the fact that although the face width of the hybrid males is slightly larger than the English average, the face height also is just above the English mean. This mean for the Norfolk Islanders is, however, distinctly larger than the mean face index of the Society Islanders.

The same difficulties encountered in dealing with the males for facial index are present for the females. The mean for the Society series of women is 84.65, very much lower than the means for Samoans, 89.8; and for Tongans, 90.8. The Marquesan average of 84.7 is, however, the same as that for Society Islanders. The series of British women gives the mean 86.64, which is two indicial units higher than the Society Islands average, but the difference is rendered less significant by the large probable error. Old American women have a mean facial index of 85.30, but this, while higher than the Society average, is not significantly greater. It seems, therefore, that no clear difference exists between the English and Society Islands women, although the English are slightly narrower-faced in proportion to the face height. The hybrid women of Norfolk Island have a mean face index of 86.31, which is higher than the So-

ciety mean value. The difference is less than three times the probable error of the difference, but more than twice the probable error. But, when compared with the English means, it appears that there is no difference from the British series, but a slight one from Old American women.

It may be concluded that the hybrid women differ hardly at all from the English for the facial index, while they tend to be significantly different from the Society Islands women, although this may be taken only as an interpretation of the actual means, since, as already pointed out, mental reservations must be retained in dealing with the facial index. (See fig. 12, p. 66.)

Cephalo-Facial Index

The cephalo-facial index measures the relationship of the maximum head width to the face width. The absolute size of the diameters involved is not indicated, however, by this index, so that two groups with radically different breadth diameters of the face and head may nevertheless have similar cephalo-facial indices. This is shown by a comparison of the mean cephalo-facial indices listed in Table XVI. The mean for the Society Islanders is 91.36. Ten Kate's series gives as the index of the means 90.86 and Gros's series gives 91.86. The Samoans are wider-faced in relation to head width than the Society Islanders; the Samoan mean is 94.2. The Tongans with a mean of 92.8 and the Marquesans with 93.5 are also wider-faced in proportion to the head width. The English means for cephalo-facial index are not materially different from the Society means. The series of Scientists yields the mean 90.64; the Convicts, 91.05; and Whitechapel, 91.62. The Old Americans, with an index of 90.1, is the only related English group which is significantly narrower-faced in proportion to the head width, than are the Society Islanders. In spite of this indicial similarity, both the mean head width and face width of the Society Islanders and English are very different.

The Norfolk Islanders have a mean cephalo-facial index of 90.67, which does not differ significantly from either parent stock. This similarity of the hybrids to the parent stocks is explained by the fact that in both face width and head width the hybrids inherited the same relative position in regard to their ancestors; that is, an intermediate position, but slightly nearer the English side so that the indicial proportion was not disturbed.

The English and Society Islands women seem to differ in mean cephalo-facial index more clearly than the males for these two stocks (Table XVI). The average for 68 Society Islands females is 90.21. Ten Kate's series gives a cephalo-facial index of 89.19, calculated from the means for head width and face width. This is probably too low, in the light of the more representative mean for the series of 68 Society Islands women and the means for related Polynesian groups. The Samoan average for women is 92.4, the Tongan 91.2, and the Marquesan 90.3. For the English, von Luschan's average for British women is the mean of the individual indices; the others are indices of the means. The British women average 88.27, while Old American females have an index of 87.70. The seventeenth century English women represented by the Whitechapel and Moorfields series, give the indices 88.65 and 88.08. Although both these agree fairly closely with the mean for von Luschan's British group, it must be remembered that these indices are derived from means which themselves are reconstructed from the skull measurements. It would seem then that there is a real difference between the English and Society Islands women. When the mean 88.98 for the hybrid women is considered, it is found to be intermediate between the parent stocks. This mean is lower than the Society Islands average by more than three times the probable error of the difference. If the Norfolk women are compared with the English, it is seen that the Norfolk mean is larger than that for the English women, but the difference is not conclusively significant. (See fig. 10, p. 66.)

Fronto-Parietal Index

It has been shown (pp. 36, 37) that the Society Islanders have broader heads but narrower foreheads than the English. As relation of the head width to the minimum frontal diameter is measured by the fronto-parietal index, it was expected that the Society Islanders would have a lower index than the English. Table XVII shows this to be true. The mean fronto-parietal index of the Society series is 64.56. The mean for Gros's series is 67.32, but is probably too high to be representative of the Society Islands average. The related Polynesian groups have the following mean indices: Samoans, 66.80; Tongans, 67.6; Marquesans, 67.4. The English, on the other hand, have higher indices. British Scientists gives the mean index of 72.19, which is very much larger than the Society average. The index of the means for

Old Americans is 68.54, also significantly greater than the Society Islands mean, but it is low when compared with the mean for British Scientists. The seventeenth century English are represented by the Whitechapel and Moorfields crania with the indices 70.37 and 69.58, respectively. The index of the Scientists group is the largest of the English groups. This may be explained by the fact that although the head width of this group was found to be above the average English head width, the divergence was not so great as for minimum frontal, in which measurement the Scientists were relatively very much more in excess of the other English means.

The hybrid males have a mean fronto-parietal index of 66.92, which is roughly midway between the means of the parent stocks, although it is close to the means for the Polynesians groups related to the Society Islanders. This intermediate position of the hybrids is the result of the fact that in both the constituent diameters of this index, the inheritance of the Norfolk Islanders was in a mid-position in relation to the parent groups.

The Society Islands women have a mean fronto-parietal index of 65.85, which is considerably lower than the means for other Polynesian series (Table XVII). Samoan women average 68.8; Tongan, 68.7; and Marquesans, 68.0. The English means for women are represented by the British women measured by von Luschan, with a mean of 72.73; the series of Old American females with an index of the means of 68.38; and the two seventeenth century English series: Whitechapel, 69.89, and Moorfields, 69.89. From this array of means it is clear that taking the Society Islands mean at its face value, there is a tangible difference between the parent stocks of the hybrid group, but if the related stocks are considered as throwing light on the Society type, then a great deal of this difference is wiped out. But it does not seem justifiable to me after a consideration of the Polynesian racial situation to make any such assumption a premise. Sullivan (83) has shown that there are at least two distinct types in Polynesia, if not more, and that these are found in varying proportions in the various island groups, with additional admixtures from other sources. The evidence then from these other groups of Polynesians is of interest in showing relationships, but they cannot be taken to represent a uniform Polynesian racial type, which is established equally in all the islands. Regarding then the Society mean fronto-parietal index as valid, it may be assumed that the hybrid mean, which is 68.29, is significantly greater than the mean for the Society Islands women, although practically identical with the Polynesian mean, exclusive of the Society Islanders. The English groups, with the exception of the Old American series, which has the same mean as the hybrids, have greater means than the Norfolk women by a statistically significant margin. It is difficult to judge the relative divergence of the hybrid group from either parent stock, since the question as to which of the English series is to be the standard is a perplexing one. (See fig. 9, p. 66.)

Zygomatico-Frontal Index

The characteristic narrowness of the Society forehead, both absolutely and in relation to the width of the head, has been noted (p. 43). In still another relationship does the peculiar character of this part of the head mark the Society Islander from the English.

The face is important as a criterion of race. Although measurements cannot express the subtle details which play so important a part in the characterization of the face; nevertheless, they are more easily subject to precise statistical treatment and are less liable to distortion by a personal equation. Absolute measurements of the face, though of prime importance, tell little of the proportions of one part to another. Absolute size is known to be correlated with a great many factors, some of which are not of a racial origin.

The relationship of the minimum breadth of the forehead to the maximum breadth of the face is striking even to the uninitiated observer. Among the inhabitants of the Society Islands the minimum frontal is not only narrow absolutely, but also in relation to the face breadth, which is broader than that of the English. Consequently, as shown in Table XVIII the zygomatico-frontal index of the Society Islanders is low, 70.66, according to this series. Gros's series gives 73.29 as an index of the means. The unreliability of this series has already been discussed. Samoans have a mean zygomatico-frontal index of 70.9, which is very close to the Society mean, Tongans 73.1, and Marquesans 72.0. The various English means are all considerably higher than the Society. The mean index for the Scientists is 79.68. This may be a little high, as the minimum frontal of the series of Scientists is higher than the general English mean. Hrdlička's Laboratory series gives an index of the means of 76.41. This derived index is prob-

ably much more reliable than Gros's figure, since it is based on 247 individuals. The Whitechapel series has a mean of 76.79, which is substantially the same as that for Old Americans. From a comparison of the two stocks, it is clear that there is a striking difference in the zygomatico-frontal index. In other words, the Society Islanders have a much narrower forehead in proportion to the width of the face than have the English. The mean of the Norfolk Islanders is 73.91. When this mean is compared with the Society series and the Scientists, the position of the Norfolk Islanders is nearer to the Society. But as already pointed out the minimum frontal for the Scientists series may not be entirely characteristic of the English, and would, therefore, affect the zygomatico-frontal index. Taking, therefore, the Old American and Whitechapel indices as nearer to the English average, the Norfolk Islanders occupy a more nearly intermediate position between their parent stocks. This intermediate position seems to be the result of the fact that both the absolute measurements which enter into the zygomatico-frontal index, are inherited as intermediate to the English and Society Islanders.

Society Islands women have a mean zygomatico-frontal index of 73.21. Samoan women average 74.5; Tongan, 75.4; and Marquesan, 75.2. These are slightly higher than the Society Islands mean. Strikingly higher, however, are the English averages (Table XVIII). The series of British yields the mean 82.5, while Old American women have an index of 77.91. The Whitechapel females give an index of 78.83, derived from reconstructed means, and Moorfields, 79.35, obtained by the same method. The Norfolk Island women have an average zygomatico-frontal index of 76.84, which is significantly larger than the Society Islands mean, and also with the possible exception of Old American women significantly lower than the English mean values. This roughly mid-position of the hybrid females is, as with the males, due to the fact that the half-breed women have inherited a mean face width and minimum frontal diameter, which is intermediate to the parent stocks. (See fig. 11, p. 66.)

Zygomatico-Gonial Index

The zygomatico-gonial index defines more closely than do the absolute measurements the proportions of the lower half of the face. It is the relation of the maximum width of the face to the bigonial diameter, the distance between the angles of the lower jaw. It is apparent that the character of the lower part of the face is important in giving to a group or type a proper description. A face which is flat-sided is at once distinguished from one that is triangular, and such a difference the zygomatico-gonial index indicates.

The Society Islanders have a mean zygomatico-gonial index of 74.01. This mean does not differ greatly from the means for ten Kate's and Gros's series. These indicial means define a type, which is wide-faced and with a width across the angles of lower jaw, which is comparatively smaller than is found among the English. Of the related Polynesians, the Samoans and Tongans with 71.7 and 73.2 are of a similar type, while the Marquesans, who have a mean index of 76.8, approach the English type of face with relatively straight sides. For the English there are, unfortunately, only two means on the living owing to the great paucity of facial measurements. The British Scientists have a zygomatico-gonial index of 77.08, and the Old Americans an index of 76.70. This shows clearly the difference between the Society Islanders and the English in the proportions of the lower face. Although the absolute bigonial diameters of the English and Society Islanders are not markedly different, nevertheless, the face width of the Society Islanders is sufficiently larger to produce a really significant zygomatico-gonial difference. The Norfolk Islanders have a mean zygomatico-gonial index of 76.44, which is only slightly lower than the Old American mean, but .64 units lower than the Scientists mean, which is within twice the probable error. It is, however, significantly higher than the Society mean. Thus the descendants of the mutineers of the *Bounty* have a mean zygomatico-gonial index, which is higher than the Society Islands average to a considerable extent, but which is very close to the English mean.

The difference between the English and Society Islanders for the zygomatico-gonial index is more sharply defined among the females, although the mean difference is perhaps not greater than it is among the males. The mean for Society Islands women is 73.90. The index of the means for ten Kate's females is even lower, 72.98. The Samoan females have a mean of 72.5 and the Tongans 72.5, both of which are lower than the mean for the series of Society women, but probably not significantly so. The Marquesan females, as do the males, approach more closely the English mean index with an average of 75.9. The extremely

scanty English data indicate that for this index the English are definitely higher. The British women average 76.86 and Old American women 75.75. It will be seen from Table XIX that the hybrid women, with a mean of 76.37, resemble the males in inheriting a mean very similar to the English average. (See fig. 13, p. 66.)

NASAL INDEX

The difference between the English and Society Islands nasal index is considerable. As shown in Table XX, Society Islanders have a mean index of about 80.0. Other Polynesians, like the Samoans and Tongans, have lower indices, and the Marquesans, with a mean of almost 82.0, even exceed the Society average. On the other hand, the English averages range from about 63.5 to 70.0. In spite of the possibility of great variance, because of the personal equation in locating nasion, the difference between the racial means is so large as to be significant.

The hybrid Norfolk Islanders have a mean nasal index of 68.0. This average is about 12 indicial units lower than the Society mean, but falls within the extreme upper limit of the range for English means. This approximation of the hybrid nasal mean to the English may be accounted for by the fact that although the nasal height does not differ from either parent stock, the nose width does show a tendency to approach the narrower nasal width of the English.

In the females also, the parent stocks show a wide difference for the nasal index. The Society series of women averages about 77.0. (See Table XX.) The related Samoans and Tongans are slightly narrower-nosed, but the Marquesans, on the contrary, are wider-nosed. The mean for the British is 62.64 and for old American women 66.0, Like the men, the hybrid women tend strongly to approximate the English. The mean for Norfolk women (66.63) is about 10 indicial units lower than the Society index and only slightly greater than the index for Old American women.

Eye Color

The inheritance of eye color is not yet entirely understood. As a result, however, of the researches of Davenport (24), Hurst (51), and Bryn (16), it may be stated that pure blue eye is recessive to a pigmented (brown or mixed) eye.

Whether or not such mixed types as blue eyes with sharply marked rings of brown pigment are biotypes, which are inherited differently, is not yet fully determined.

The consideration of the inheritance of eye color among the descendants of the mutineers of the *Bounty* involves an unknown factor—namely, the exact eye color of the mutineers themselves. It therefore becomes necessary to use data obtained from a study of the eye color of Englishman in general. The principal authority for the eye color of the British is Beddoe (5), and although his classification is not strictly comparable with modern usage, his data are representative and in the absence of material as good furnish a rough estimate of the average eye color among Englishmen. Beddoe divides eye colors on the following basis: (1) blue, bluish-gray, and light gray eyes, these are called light; (2) neutral eyes include dark gray, brownish-gray, very light hazel or yellow, hazel gray formed by streaks of orange, radiating into a bluish-gray field and most shades of green, together with all doubtful cases; (3) dark eyes are defined as black, brown, and dark hazel. The results which Beddoe obtained by this method show clearly that the English are by no means uniform in eye color. Unfortunately Beddoe's data are not averaged nor are the sexes separated. From his check series of 8380 males derived from military sources the percentages can be estimated, since these two series were found to produce similar results. Of the Military series, 61.1 per cent had light eyes, while 38.8 per cent had dark eyes. It is instructive to compare these with the percentages for Old Americans who are essentially British stock. (See Table XXII.) It is clear that a heterozygous condition must be assumed for the mutineers, for eye color, since the percentage given in Table XXII show no uniformity among the English, although, in all probability, light colored eyes represent at least 50 per cent of both males and females. Three of the six mutineers who left offspring on Pitcairn Island are described as being dark haired or dark complexioned, the remaining three as having light brown hair. This variation in hair color was probably paralleled by similar variation in eye color.

The Society Islanders, on the other hand, present an approximate uniformity of eye color. (See Table XXIII.) Of 152 males and females, 127 have dark brown eyes, 24 light brown, and 1 gray-brown eyes. The Samoans and Tongans are as uniformly brown-eyed; only a single female among 215 Tongans had blue eyes. However, among 158 male and female Marquesans, 13 are re-

corded as blue-eyed. This gives the unexpected figure 8.23 per cent, for the incidence of blue eyes. It is essential to determine the validity of this high proportion of blue eyes among the Marquesans, for otherwise doubt must remain regarding homozygosity among the Society Islanders, who are not only a related group, but who also were in contact with the Marquesans before European discovery. It should be remembered that European contact with the Marquesas and the Society Islands has been extensive and long continued with the result that a certain amount of white blood has been added which may have been overlooked in the genealogies of islanders. But the Tahitian ancestors of the Norfolk Islanders were of a period before the European contact assumed large proportions, and therefore, it is reasonably certain that the Society Islands side of the ancestry of the hybrids, was a stock fairly homozygous for brown eyes.

In the distribution of eye color among the Norfolk Islanders as given in Table XXIV, it will be noticed that the females as compared with the males have higher percentages for brown and mixed eyes and lower percentages for blue eyes. This is true also for the Old Americans (Table XXIII) and Bryn found a similar relation in a Swedish group which suggested a sex-linkage. The Mendelian analysis of the Norfolk Island sample for eye color must, of course, be problematic, for although a homozygous brown eye can be assumed for the Society Islanders, the eye color of the mutineers is not known with certainty. If DR be used to represent the English and DD the Tahitian, the predicted expectation is:

P.		DR x DD	
F_1		2DD	2DR
F_2	9DD	6DR	1RR

Then 9DD would have the proportion of 56.25 per cent to the whole, 6DR, 37.50 per cent, and 1RR, 6.25 per cent. The proportions among the hybrids when the males and females are grouped together are:

	Brown(DD)		Mixed(DR)		Blue(RR)	
Theoretical expectation		56.25%		37.50%		6.25%
Norfolk Islanders	41	36.28%	57	50.44%	15	13.28%

Assuming that the English mutineers were DR or heterozygous for eye color and that the Society Islands women were DD or homozygous for brown eye, a comparison of the Mendelian expectation with the actual figures for the Norfolk Islanders points to the fact that the hybrids have a greater proportion for blue and mixed eyes and a smaller for brown eyes than would be expected. The discrepancy may be accounted for in several ways. It seems altogether probable, from a consideration of the large proportion of blue eyes among the English population, that DR does not give an adequate estimate for the color of the mutineers' eyes, but that a closer approximation would include some RR. Also in making a theoretical expectation, no allowance is made for the human factor. That is to say that, for a cross originating with DD and DR with some 20 offspring, 10 of whom are DR and 10 DD in the first generation, the theoretical expectation would give equal proportions of the DD's and DR's, not only crossing among themselves, but equally crossing with each other. But the probabilities are very slight that this would occur in the proper proportions in so small a number. It is true that in large series the panmixia is thorough, but the F_1 generation under consideration was very small in numbers. Furthermore there has been back-crossing with European stock which has undoubtedly helped to increase the number of lighter colored eyes. Although I have a record of an F_1 male marrying a Society Islands woman, widow of a mutineer, and another of the same generation also marrying a Tahitian, nevertheless three Europeans intermarried with the first generation on Pitcairn Island and since then, on Norfolk Island both British men and women have intermarried to a certain extent.

Although the actual percentages for eye color among the Norfolk Islanders do not suggest a DD x DR original crossing, the Mendelian expectation from a DD x RR crossing would be equally at variance with the actual figures as the theoretical percentages would then be too high for blue and too low for brown eyes.

	Brown(DD)	Mixed(DR)	Blue(RR)
Norfolk Islanders	36.28	50.44	13.28
Theoretical expectation from DDxRR..	25.	50.	25.

The genetic composition of the mutineers for eye color has not been determined and therefore the approximation of the hybrids to any theoretical expectation cannot be estimated. Nevertheless it is clear that the typical Mendelian phenomena of dominance and segregation occur.

Epicanthic Fold

The Mongoloid eye consists essentially of a fold of skin arising above the upper lid, folding over

the inner canthus and covering the caruncula lacrimalis. This fold may be associated with a narrow and slanting eye, but not necessarily. Frequently untrained observers mistake the slanting, narrow eye for the eye with epicanthic fold. The highest incidence of the epicanthic fold occurs among Mongoloid peoples. But Polynesians also are marked to a much less degree by this feature. Of the groups listed in Table XXV, the Society Islanders, both male and female, possess a higher percentage of the epicanthic fold than do the related groups of Polynesians. The Society Islands females have a percentage of 20.9 with marked epicanthic fold as compared with 7.14 for males. It seems that the Society Islanders are mixed in this respect since there is an appreciable proportion which lacks all traces of the fold. The English are in all probability without the epicanthic fold. The epicanthic fold has been found in Central Europe, especially in young children, but it may be assumed that such a fold is extremely rare in England, as it is among Old Americans. The hybrids, both males and females, are predominantly without any trace of the fold. Among the males 1.61 per cent and among females 2.27 per cent have a trace of the fold. It would seem from this that the epicanthic fold is not dominant among the hybrids of Norfolk Island. Nevertheless Dunn (30) found epicanthus as a dominant in Hawaiian-Chinese crosses.

Skin Color

The skin color of the Norfolk Islanders was observed both on the inner side of the upper arm and in the region of the cheek, in order to obtain the color of both unexposed and exposed skin. The degree of pigmentation was compared with von Luschan's color scale and expressed in terms of his classification (Table XXVI). Most of the Norfolk Islanders, both males and females, were grouped between numbers 7 and 9 for the unexposed skin color. The color of the cheek tends to a greater variability, due perhaps to differences in degree of exposure. The males vary from number 10 to number 18 with one recorded for number 21, but the majority are found between numbers 13 and 16. The females, as would be expected, are lighter than the males for cheek pigmentation. They vary from number 7 to number 16, with one recorded as "pinkish white," since no color on the scale accurately corresponded with the observed pigmentation. The majority of the women, however, fall between numbers 10 and 13.

The inheritance of skin color is not yet satisfactorily established in all respects. Davenport (21), who conducted extensive investigations on negro-white crosses, found that segregation was characteristic of the F_2 generation.

As far as I am aware, there are no data for an English sample expressed in the terms of a standard color chart. Of the English mutineers, three are described as dark in complexion and three as fair. As this description was probably based on the color of the face, the three described as dark probably had much lighter unexposed skin. There is undoubtedly an individual difference in darkening under exposure to weather. The Polynesians are generally described as medium brown in skin color. Sullivan (83) found that for the unexposed parts the Samoans were best represented by the numbers 14, 15, and 16 on the von Luschan scale and the Tongans by numbers 14, 15, 16, and 17. The females of these groups were one grade lighter.

Tables XXVI and XXVII show two groups among the Society Islanders, one considerably lighter in color than the other. For the males the darker group is more numerous, for the females the lighter group is larger.

Both the males and females of the hybrid group are considerably lighter-skinned than the Tahitians or other Polynesians. The extremes of skin color of the Norfolk Islanders approximate the fair European on the one hand and the dark Polynesian on the other. The hybrids, however, do not reach the extreme dark tints of the Society Islanders. The range of pigmentation for exposed and unexposed skin does not differ notably among the Society Islanders. The Norfolk Islanders, however, show a clearly marked difference between the color of the unexposed skin and the cheek. The cheek pigmentation, which represents the tanning potentiality of the hybrid, is very much darker than the color of the unexposed skin and approaches very closely the exposed skin color of the Society Islanders. In other words, it appears that although the unexposed skin color of the hybrid males is intermediate between the Society Islanders and the English, the potential pigment which might develop from exposure is really as dark as the fully developed pigment of the darker ancestral group, the Society Islanders. In cheek pigmentation the Norfolk Island women do not approach the Society Islands women as closely as do the males.

The clear segregation for unexposed skin color

indicates a Mendelian inheritance for this character. The majority of the hybrids have an unexposed skin color which is obviously a blend of the dark Society Islands and fairer English skin color. However, the intense darkening observed on the exposed skin of the Norfolk Island males points to an inheritance of heavier pigment which is latent.

Hair Color

The hair color of the Society Islanders is dark brown to black. This is also the typical hair color for the Samoans, Tongans, and Marquesans. Large percentages of bleached hair have been excluded from the series of Samoans and Tongans. In varying degree a reddish brown tint has been observed in the hair of the Polynesians. Among the Society Islanders, 13.4 per cent of the men and 15.15 per cent of the women are classed as having reddish brown hair.

I have listed in Table XXVIII the percentages of hair color among the Old Americans and British. The largest groups fall in the classes light brown, brown, and dark brown. The pure blonds and black are not numerous. Of the ancestral mutineers, three are described as having light brown hair, one brown hair, and one dark brown; the other had a dark complexion but nothing is said concerning the color of his hair.

The hair color of the hybrids is predominantly black and dark brown. Of the males 9.09 and 1.82 per cent are brown and blond respectively. The females show a slightly greater tendency toward lighter colored hair than the males, with 4.26 per cent blond, 2.13 per cent light brown, and 12.76 per cent brown. The small proportion of segregated pure blonds might indicate that hair color is a multiple factor character with dark hair dominant over light. That hair color is perhaps not a result of pigment alone, but of the density of growth and structure of the individual hair has been suggested as a possible complicating factor which should be taken into consideration in the inheritance of hair color. The dominance of black and dark brown in the Norfolk Islanders agrees with the general belief that dark hair is dominant over light. In Table XXIX the Mendelian expectation in the F_2 generation of a DD x DR cross is compared with the actual percentages found among the Norfolk Islanders. The hair color proportions for the females are very close to the theoretical expectation. The males show a greater dominance of black hair.

The percentage of red-brown hair among the Norfolk Island males is 3.63 which is roughly as 1:3 when compared with 13.41 per cent for the Tahitians. The same proportion exists for the females of Norfolk Island and the Society Islands women. This ratio would appear to be an indication that red or rather red-brown is a unit factor character and recessive to brown or black pigment.

The percentage of gray hair among the Norfolk Islanders is a very interesting phenomenon. Of 64 adult males, 9 had abundant gray hair giving a percentage of 14.06. The youngest of the males with incipient gray hair is 44 years old. All the men from 55 years on to the oldest in the series, 76 years old, had gray hair. Of the Society Islands males only 3 out of 85 had gray hair, giving a percentage of 3.53. The early appearance and large incidence of gray hair is an English characteristic, which is especially clear when they are compared with the Society Islanders, where gray hair is very rare except in the aged. Of 250 Old American males only 42.8 per cent are entirely free of gray hair. Gray hair appears very early in Old American males, in some men under thirty years of age; 16.4 per cent are two-thirds to nearly all gray. The male hybrids then inherit the English tendency to gray hair, but with an initial graying at a later age than among the Old Americans.

This is also true for females. Of the hybrid women 4.08 had gray hair. Among Society Islands women there is an incidence of 1.49 per cent of gray hair. The proportion of gray hair among Old American women is considerably higher than in the Norfolk or the Society series. Hrdlička gives 52.0 per cent who are entirely free of gray hair and 10.5 per cent who have two-thirds to nearly all the hair gray. The per cent for gray hair is more comparable with the Norfolk percentage which indicates the amount of hair markedly gray. The men, as contrasted with the women, are much nearer the English in the incidence of gray hair.

In the loss of hair of the head, the Norfolk males exhibit an interesting heredity. No baldness or even incipient loss of hair was recorded for any of the Society Islands males. But among the Old Americans the case is quite different. Among 250 males only 45.2 per cent are described as suffering no perceptible loss of hair, 13.6 with slight loss, 22.4 with some loss to one-third of the hair lost, 7.2 with approximately one-half lost, and 11.6 with two-thirds to near all. Baldness may begin very early in Old Americans, but in the

average it becomes appreciable in the decade 40 to 50 years. The Norfolk Island males have the following percentages for loss of hair; slight, 1.56 per cent; medium, 9.38; and marked, 12.50. The percentages for medium and marked, where the baldness is unequivocal are seen to agree very closely with the Old American figures. The youngest person with evident loss of hair among the Norfolk Island males is about 35 years old with medium baldness, but the loss of hair becomes marked at about 40. Thus both the tendencies to baldness and graying of the hair are dominant in the Norfolk hybrids.

Hair Form

Hair form falls easily into the classification: straight, low waves, deep waves, curly, frizzly, and woolly. The waviness is determined by the depth in relation to the width of the wave. A wave which is 1/10 to 1/12 as deep as it is wide, is called low. When the depth is one-half the width it is called deep. True curly hair forms a complete or nearly complete circle or spiral. Frizzly hair has very short and deep waves as distinguished from the wider waves of true wavy hair. Woolly hair forms a close knit mass of tight spirals. Davenport (25), one of the first to study the Mendelian nature of the inheritance of hair form, found that curved is dominant over straight European hair and that the more pronounced forms of waviness or curliness are dominant over the less curved types. He found waviness to be the probable heterozygous condition. These studies were made on the basis of straight hair as found among Europeans. There is reason to believe that the Mongoloid type of straight hair, when crossed with the curved types of hair acts differently. Fischer (35) in his classic study of race mixture substantiated this dominance of the curved over straight hair. He obtained the proportion of 71 straight-haired to 228 curved-haired individuals, which compares favorably with the theoretical Mendelian expectation of 74.75:224.25.

In considering hair form inheritance among the Norfolk Islanders, the same difficulty arises: there is no evidence that the English sailors who entered into the original cross were straight-haired. Unfortunately, at least to my knowledge, there are no statistics on the hair form of the English. Of the Old Americans who are of predominantly British stock, Hrdlička (49) says: "The hair of the head . . . is generally straight or nearly so. Pronounced natural wave is very exceptional, and naturally curly hair was met with in only one instance, a male." The Polynesian hair form does not present a sharp difference from the English, which from the point of view of a study of inheritance makes the analysis of the hair form among the hybrids difficult.

The hair of the Polynesian often has been described as wavy, but this is hardly accurate as a characterization of the type. (See Tables XXX and XXXI.) The Society Islanders resemble the Samoans and Tongans closely in the percentages for the various forms of the hair. The Society Islands males have 44.7 per cent with straight hair and 55.3 per cent with curved hair, including the low waved. The proportions are similar for females.

Table XXXI presents the percentages for Society Islanders and Norfolk Islanders. The discrepancies found between the Society Islanders and the hybrids are principally for deep waves, curly, and frizzly. This may be accounted for on the grounds of personal equation. The classification of the Tahitians in the field was checked in the laboratory by hair samples, but for Norfolk Islanders I was unable to obtain hair samples. As it stands, the Norfolk Islander males have a slightly larger percentage for straight and a considerably larger one for frizzly hair. The hybrid females show the same type of distribution. The comparison clearly shows that the Society Islands distribution is dominant over the English. It seems, however, that the more pronounced curved types of Society Islands hair have been inherited in slightly greater proportions than is found among the pure Tahitians. From the nature of the percentages and the lack of exact knowledge of the hair form of the mutineers, it is a difficult and not particularly instructive task to attempt to make comparisons with theoretical predictions. Nevertheless a Mendelian segregation is indicated in the distribution of hair form among the Norfolk Islanders.

Hair Growth

There is considerable variation in the heaviness of hair growth among the Polynesian groups (Table XXXII). The observations on the face hair have been divided into upper cheeks, lower cheeks, chin, and moustache. The density of hair growth varies in the different parts of the face. The face hair of the Society Islanders is much sparser than that of natives among the other island groups, the majority of the Society Islanders are

only slightly bearded. In all parts of the face the hair growth of the hybrids is very much heavier than for the Society Islanders, the proportion of medium and heavy is very large for the hybrids. I have not been able to secure any comparative data on hair growth among the English, but Martin places the Europeans in general among the strongly haired races. The same condition obtains for body hair on the chest, legs, and forearms. The hybrids are much more strongly haired than the Society Islanders on the body and face. The indications are that this is dominance of a European trait, but it is impossible to say to what extent the hybrids have equalled or surpassed the English.

Forehead

Slope of the Forehead

The slope of the forehead is to a certain extent correlated with the degree of the development of glabella. Theoretically it is also associated with the shape of the head, a broad and high vaulted head going with an elevated and more or less vertical forehead. The head of the Society Islanders is unquestionably broad and high but the slope of the brow is not predominantly vertical. (See Table XXXIII.) The Samoans and Tongans, who are less broad-headed, have a greater percentage of vertical foreheads. This difference between the Society Islanders and the Samoans and Tongans may be due to the more prominent frontal ridge among the Tahitians. The majority of the Society Islanders have moderately sloping foreheads and 18.29 per cent of them have foreheads markedly sloping. The Samoans and Tongans show a considerably lower percentage for low foreheads and a correspondingly higher one for vertical foreheads, but the Marquesan foreheads are mainly moderately sloping. The English, on the other hand, as represented by the series of Old Americans, are 97.3 per cent vertical browed and only 2.7 per cent moderately sloping. Even granting a large margin of error due to a personal equation in the observer as to what constitutes a vertical or a moderately sloping forehead, the difference between the percentages for the Society Islanders and the English is too great to be accounted for other than as a difference attributable to race. It is of interest to observe the inheritance of this contrasting character. The male hybrids of Norfolk Island are closer to the Society Islands distribution than to any of the other groups listed in Table XXXIII, either Polynesian or Old American. The percent of vertical is 13.11, which is practically identical with 13.42 per cent for the Society Islanders. It seems that the hybrids have exceeded the Society Islanders in the tendency to markedly sloping brows, which is more a trait of Society Islanders than it is English. A part of this remarkable similarity may be discounted but the fact cannot be disregarded that in all probability the Society Islands brow with its characteristic slope is completely dominant over the English.

The females have in the inheritance of slope of the forehead behaved differently than the males. To a great degree a vertical forehead with an absence of a marked development of glabella is a female characteristic. This sex difference is clearly shown in Table XXXIII where in each of the groups listed the women have a greater percentage of vertical brows than the men and a smaller percentage or even absence of low or marked slope. For the Society Islands the women agree with the men in that they both possess more sloping foreheads than do the other Polynesians groups. Among the Society Islands women 20.0 per cent have vertical, 75.38 per cent moderately, and 4.62 markedly sloping foreheads. The Old American women, however, have 98.0 per cent with vertical brows, and only 2.0 per cent with moderately sloping ones. The hybrid women of Norfolk Island have not inherited exclusively the distribution of the Tahitians as have the hybrid males. The percentage for vertical among the Norfolk women is 67.35. The percentage for low is 4.08, which agrees very closely with 4.62 for the Society Islands women. From this comparison it seems that the vertical forehead of the English women is in partial dominance with a segregation of the markedly sloping brow.

Glabella

The Tahitian males vary considerably from their neighbors, the Samoans and Tongans, in the degree of the development of glabella. The Society Islanders have a greater prominence of glabella, both among the males and females. Among the males there are 56.1 per cent with prominent glabella, while the Samoans have only 14.7 per cent and the Tongans 8.0 per cent. The Marquesans approach nearer to the Society Islanders than the Samoans or Tongans, but do not attain the same degree of glabellar development. Similarly with the slope of the forehead, the prominence of the glabella is apparently a sex character within the

group. The series listed in Table XXXIV show less development of glabella among the females than the males, a difference which is probably associated with the slope of the forehead. Again the lack of data on the English forces reliance on the material published by Hrdlička on the Americans in order to obtain an idea of the English type.

Old Americans have a majority (65.3 per cent) who have a medium developed glabella, 8.0 per cent have a glabella of above medium development and 3.3 per cent with prominent glabella. The amount of smoothness in the glabella region is probably the same in both the Society and English groups, the great difference resting in the larger percentage for prominent development among the Tahitians. The finer classification of Hrdlička makes the percentages not strictly comparable. If the same classification had been used for the Old Americans as was employed in dealing with the Polynesian groups and the hybrids, it is probable that the percentage of smooth would be equal if not greater than that found among the Society Islanders. It must be recognized that unconsciously the investigator, in observing a group possessing a marked character, is apt to regard as absent only a slight development, since its deficiency in relation to the more frequent and greater developed trait tends to emphasize the lack or absence. At any rate, it is clear from a study of Table XXXIV that the English and the Society Islanders differ in respect to glabella; that the English are predominantly medium, while the Tahitians are in the majority prominent. The estimation of Mendelian inheritance, however, where the overlapping is considerable, is very difficult and hazardous. From a consideration of the percentile distribution of glabellar development among the hybrids, it is obvious that the Norfolk Island men have practically the same distribution as their Tahitian ancestors with a very slightly less developed glabella. The probabilities are that the dominance of the Society Islands type is more or less complete but due to the considerable overlap, it is impossible to say to what extent this has statistical validity.

The situation, on the other hand, is by no means so clear for the women. The sub-medium class of Hrdlička makes the comparison of the women less easy, since the class frequency is very great and therefore, significant. To what extent is the 50.7 per cent of sub-medium for Old Americans equivalent to the smooth or medium of the Tahitians? By dividing the frequency of sub-medium impartially between the two, the resultant percentages for medium and smooth iron out the difference between the two parent stocks. The hybrid women, however, show a greater percentage of prominent glabellas than do either the Society Islands or English women, which is difficult to explain.

Nose

NASAL PROFILE

The nasal profile of the Society Islanders and the Norfolk Islanders has been classified as convex, straight, and concave. Such forms as concavo-convex also occur, but the material from Norfolk Island was grouped similar to the Society Islands data for ease of comparison. From Table XXXVI it will be seen that the great majority of the Society Islanders are straight-nosed, and that only slightly more are concave than convex-nosed. The females of the Society Islands, however, have a relatively greater per cent who have concave noses and fewer who have straight noses. This tendency for women to possess a greater percentage of concave noses is a widespread characteristic.

The hybrid males have, predominantly, a convex nose which indicates a dominance of the European nasal profile among the Norfolk Islanders. It is apparent from Table XXXV that the hybrid males approach very closely the nasal profile type of the English as represented by Hrdlička's Old Americans. The concavo-convex group of Old Americans would probably be grouped as convex if the threefold classification were used. By adding together the convex and the concavo-convex for Old Americans, the correspondence with the Norfolk Islanders becomes very close. The hybrid women, however, show a tendency to greater proportion of straight and concave noses than the males and consequently occupy a more intermediate position. The exception is the convex type in which they are relatively closer to the Old American women, although not reaching their high percentage when the convex and concavo-convex are grouped together.

NASAL BRIDGE

The nasal bridge has been classified as low, medium, and high, when viewed from the side. The distribution of the nasal bridge elevation for the Society Islanders corresponds rather close-

ly with the related Polynesian groups of Samoa, Tonga, and the Marquesas, as shown in Table XXXVI. The majority of these groups in each case is predominantly in the class of medium elevation. The percentage for low nasal bridges is greater than that for high. Among the Polynesian females the percentage for high nasal bridge is lower than that for the males among the Society Islands females, none was found who could be classified as having a high nasal bridge. This lowness of the nasal bridge is undoubtedly correlated with the greater tendency among the women toward concave nose type. In general the women are considerably lower in elevation of the nasal bridge than are the men. The hybrid men of Norfolk Island have much higher elevated nose bridges than the Society Islanders, the percentage for high being 68.75 as compared with 4.88 for the Society Islands males. In this respect as in nasal profile the hybrids appear to be dominantly of the European type. Unfortunately, I have no comparative figure for English populations, but there seems to be no doubt that the English have high-bridged noses. The women of Norfolk Island seem to have less high-bridged noses than the men, and also to approach to the Polynesian type more closely, although the divergences from the Tahitian percentage is considerable for high and low bridged: 57.4 per cent of the Norfolk women have medium-bridged noses as compared with 50.0 for Society Islands women. On the whole it would appear that in the male hybrids the elevation of the nasal bridge of the English is almost completely dominant, but only incompletely so in the Norfolk women, who retain a greater percentage of the low and medium elevated nasal bridges.

AXIS OF NOSTRILS

The inclination of the nostrils when seen from below upward has a varying angle. The low wide nose of the negro has nostrils directed transversely while the narrow, high-bridged European nose has nostrils directed antero-posteriorly. The classification used here is antero-posterior, transverse, and oblique, which is the intermediate condition. The Society Islands males and females fall principally in the transverse group, 77.65 per cent of the males and 82.35 of the females (Table XXXVII). There are records of nostrils directed antero-posteriorly. This distribution of the axis of the nostrils among the Tahitians, when compared with the other Polynesian groups, appears to be much more negroid. It is highly improbable that the Tahitians differ so greatly from the Samoans and Tongans, especially in view of the fact that they agree so closely on the elevation of the nasal bridge. I think that there is justification for regarding the axis of the nostrils of the Society Islanders as being in all probability closer to the Samoan-Tongan type than they are recorded. In comparing the Norfolk Islanders with the Society Islanders and other Polynesians it is seen that the Norfolk Island men differ from the Samoans and Tongans strikingly in the antero-posterior group, but the percentage of transverse axis is greater among the hybrid males than for antero-posterior. The divergence of the Society Islanders from the rest of the Polynesians is unfortunate, since the acceptance of the percentile distribution of the Tahitians radically affects the conclusion as to whether or not the antero-posterior axis of the European is dominant over the transverse. My own feeling is that it would be nearer the true distribution should the Society Islanders be regarded as more nearly similar to the Samoan-Tongan group. The Norfolk males would then occupy a position intermediate between the parent stocks, and perhaps slightly nearer to the Polynesian. This would fit the qualitative impression I received on Norfolk Island that the nose had the elevation and profile of the European type, but was considerably heavier in appearance, with a massive tip, slightly depressed, and with wide nostrils.

The females are reversed in this character. They approach the English type more closely than do the males. The percentage of antero-posterior axis is 38.30 and 6.38 for transversely directed axis. It appears that the dominance of the antero-posterior axis is more nearly complete among females.

NASAL SEPTUM

The nasal septum in the hybrids is considerably narrower than among the Society Islanders. As shown in Table XXXVIII the percentage of narrow for the Norfolk Islanders is 46.9, while it is 6.49 for the Society Islanders. I have not been able to procure comparative data for the width of the nasal septum among the English, but it seems very probable that the narrow septum would be very largely represented. The hybrid females also exhibit the same tendency as the males, but in a less pronounced degree. Only 31.11 per cent

have narrow septa. The medium group is larger among the females than the males.

Seen from the side, the septum may or may not be exposed. When the lower border of the alae are level with the lower border of the septum it is called level, when the alae cover the septum completely, the condition is designated as hidden. The Society Islanders have a percentage of 54.22 with exposed septum and 22.89 per cent with level and 22.89 with hidden. The hybrids are overwhelmingly in the class group of exposed. The same relative proportions between the hybrid and the Society Islands females are found as in the hybrid and Society Islands males. Unfortunately the exposure of the septum is not recorded in any of the English series of which I am aware, so that comparison cannot be made between the hybrids and their English ancestors.

Prognathism

The Society Islanders, as shown in Table XXXIX, have only a very slight degree of prognathism. The Samoans and Tongans, on the other hand, have a much greater amount of medium prognathism, 17.8 and 24.6 per cent respectively for males and 17.4 and 15.5 for females. The Marquesan males agree exactly with the Society Islanders in the overwhelming proportion of orthognathous profiles. The English, in all probability, have practically no prognathism but unfortunately no statistics are available on that feature. The hybrids, both male and female, have a slight amount of prognathism, 6.9 per cent for males and 2.27 per cent for females.

Prominence of the Chin

The data on the chin among the Old Americans are more finely classified than they have been for the Society and the Norfolk Islanders. The Old Americans are divided into sub-medium and above medium besides the major classes of prominent, medium, and receding. It seems clear on qualitative grounds that the Polynesians as a group do not exceed the European in the prominence of the chin, although it would appear to be so from a comparison of the percentages listed in Table XL. At any rate, in both the Society Islanders and Old Americans the medium class is predominantly the type, while the Society Islanders have a small proportion of receding; the English, as represented by the Old Americans, have no receding chins. It does not seem entirely justifiable to conclude that the receding chin is so uncommon among English. At any rate, the hybrids, both male and female, are very much less medium than either of the parent stocks with a much greater percentage of prominent and a small proportion of receding. There seems to be no doubt that the hybrids, both men and women, have segregated in contrast to the greater homogeneity of the parent stocks. This behavior is not entirely clear in the face of a not particularly great difference between the English and the Tahitian.

Lips

The data on lip thickness are not satisfactory. Little work has been done on this character with the result that a standard for the various degrees of lip thickness has not been universally recognized. From an observation of the percentages listed in Table XLI it appears that the Society Islanders, Tongans, and Marquesans have a larger percentage of thin lips than have the Old Americans, a conclusion which seems hardly accurate, unless the percentages be interpreted in terms of the group observed. In other words the percentages given for Old Americans and the Polynesian groups are valid only as an indication of lip thickness, considered in the light of the group itself and not as an absolute standard applicable to all peoples. From a qualitative point of view, the English and European in general are naturally classified as a thin-lipped people and the negro as thick-lipped. The Polynesians are in the main probably intermediate between these two extremes. The Society Islanders have 10.71 per cent of thick lips for males, and 7.35 per cent for women. There are no thick lips among the Old Americans. With the lack of any unequivocal data for either parent stock, it is impossible to say whether or not the thickness of the Society Islanders or English lip is dominant in the hybrids. There is, however, excellent proof of segregation, as the percentages of thick and of thin lips among both the males and females are very large compared to the parent stocks. In all probability the F_1 generation blended for lip thickness with a clear cut segregation in the succeeding generations. The only qualitative observation on the F_1 generation is by Beechey (6) who writes that the lips partake of the Tahitian character and are broad and strongly sulcated. Strongly sulcated lips are not an English trait.

For the females among the hybrids the inheritance is essentially the same as among the males.

POSITION OF HYBRIDS IN RELATION TO ENGLISH AND TAHITIANS

The comparison made here between the hybrids of Norfolk Island as a group and the Society Islanders and British groups is believed to be representative for the Society Islanders, but no one of the English series has the merit of representing, beyond doubt, the average English population. Therefore, the result of this comparison is intended to be interpreted as tentative. Such an evaluation may be made from a consideration of tables XLII-LVII.

In Table XLII the means of the Norfolk Island and Society Islands males are compared for 15 anthropometric characters. The differences between the means are compared with three times their probable errors. For 7 of the 15 characters the Norfolk hybrids are not significantly different from the Society Islanders. In two others, arm length and nose height, the difference is only slightly greater than three times the probable error. Thus in about half of the characters listed, the hybrids have mean values which are not significantly different from the corresponding means for the Society Islanders. The indices of these two groups are given in Table XLIII, where of fourteen indices, only in one is the hybrid mean different by less than three times its probable error.

A similar comparison of the Norfolk Islanders and British Scientists in Table XLIV reveals that out of 11 characters for which the two groups are compared, 7 show hybrid means not significantly different. This marked similarity in the anthropometric characters of the hybrids of Norfolk Island and the British Scientists, while of great interest, should not be considered as conclusive evidence of a tendency for the hybrids to inherit more of the English than of the Tahitian traits, as the series of Scientists is not entirely representative of the general English average, especially in such characters as head width, bizygomatic diameter, and stature. (See pp. 34, 36.) For indices of the hybrids and the Scientists as compared in Table XLV, 4 out of the 8 means given show no significant differences. In order to make the relationship of the hybrids to the Society Islanders and British Scientists more nearly comparable, I have arranged in Table XLVI only those characters for which I have a mean value for both Tahitians and Scientists. It is at once apparent that the hybrids have more characters that approximate to the Scientists than to the Tahitians.

However, in comparing the hybrids with the English Convicts, the situation is quite altered. For each of the eight characters listed in Table XLVII, the hybrids are significantly different by a considerable margin.

A comparison of sixteen means for the Norfolk hybrids and Old Americans is given in Table XLVIII. Unfortunately the probable errors of the means for the Old Americans' series are lacking so that I was not able to compute the probable errors of the differences. However, if the difference between the means are compared with three times the probable error of the Norfolk mean alone, a basis for the judgment of significant differences is obtained. In 5 characters: stature, sitting height, leg length, span, and chest depth, the hybrids are not appreciably different from the Old Americans. In addition, for the head length and head width the hybrids are not significantly different from the Tennessee group or in head height from the combined Laboratory and Virginia groups. Thus, in at least a third of the characters, the hybrids are not appreciably different from the Old Americans. This is not so close a similarity as was found for the hybrids and the Society Islanders or the British Scientists.

The comparison of the indices of the Norfolk Islanders and the Old Americans seems to give a similar proportion of similarity. In Table XLIX of the 12 indices given, 4 show no significant difference between the hybrids and the Old Americans. In addition, the Norfolk Islanders are not significantly different from the Laboratory group for nasal index or from the Tennessee group in length-height index. Davenport's series of American Soldiers are compared with the hybrids in Table L. Of 7 characters listed 2 show no significant differences.

The female hybrids are compared with the Society Islands women in Table LI. Out of a total of 15 characters, 6 show no significant differences. The indices of these two series are given in Table LII, where it appears that in only 2 out of the 14 indices given, is there no significant difference. This lack of indicial similarity, contrasted with the greater degree of similarity found between the two groups for anthropometric characters applies also to the males.

In Table LIII the hybrid women are compared with the 11 British women measured by von Luschan, but the result of this comparison is not

to be taken with too much confidence, as the probable error is very large and a fictitious similarity is established. Of 11 characters 9 show no appreciable difference between the hybrids and the British women. For 5 of the 8 indices included in Table LIV there is no difference greater than three times the probable error of the difference. The comparison of the hybrid women with the Old American women is given in Tables LV and LVI. Out of 16 characters, only in 4 are the differences less than three times the probable error, and in 4 out of 12 indices, the hybrids are not significantly different from the women of the Old Americans series.

The apparent result of these comparisons of the hybrids with the Society Islanders, British Scientists, Old Americans, and American Soldiers reveals that the hybrids are more like the British Scientists as a group, than they are like any of the other groups. In Table LVII are listed the differences between the means for the Society Islanders and the British Scientists and those for Norfolk Islanders. These differences, when averaged, regardless of signs, indicate very clearly how much greater is the resemblance between the hybrids and Scientists, than that between the hybrids and Society Islanders. A large part of the approximation of the hybrids to the Scientists group is explained by the fact that for the head width and face width, both of which enter into 6 out of 8 indices, the Scientists have a much greater diameter than has the average Englishman.

The resemblance of the hybrids to the Society group in anthropometric characters, however, is greater than with North European series such as the Convicts, Old Americans, and American Soldiers. But for indices, the Norfolk Islanders are more like the Old Americans than the Society Islanders. As the Scientists are not a typical sample of the average English population, it does not seem justifiable to assume conclusively that the hybrids are closer to the English than to the Society Islanders in their physical make-up. The female hybrids are apparently very similar to the 11 British women, but the hybrid women are more like the Tahitian than the Old American women, except for indices. Neither the Convicts nor the American Soldiers are particularly like the Norfolk hybrids.

QUALITATIVE DESCRIPTION OF THE F_1 GENERATION ON PITCAIRN ISLAND

Among the many descriptions of the Pitcairn Islanders, that of Beechey (6) is the most detailed and illuminating. His observations, based on a visit made in 1825, apply to the children of the mutineers and Tahitian women. All of the F_1 generation at the time of his visit to Pitcairn, had attained maturity.

The great height of the Pitcairn Islanders was impressive to the early visitors. Both the men and women are described as above the common height, presumably an English standard, as all the observers were Englishmen. Beechey states that the average stature was 5 feet, 10 inches (177.8 cm.) for the men, with a range from 5 feet, 9 inches to 6 feet, 1¼ inches. Another visitor, five years later, gives the range in stature as 5 feet, 8 inches to 6 feet. Even the young boys are mentioned as of extraordinary height. One boy of eight years measured 4 feet, 1 inch and another of nine years, 4 feet, 3 inches. The women also are described as tall, although in some descriptions they are said to have been of average height, tending toward adiposity in middle age as among the Tahitian women. One woman, who was not the tallest, measured 5 feet, 9½ inches. Together with the great stature of men and women went a physical strength and vigor, combined with a symmetry of form. Beechey records the lifting of weights of 600 pounds in feats of strength.

In general, the appearance of the Pitcairn Islanders impressed the early visitors as an English type, although some are described as betraying their Tahitian blood. Nicolas (66) observed that the faces of both sexes had a "noble and intellectual" expression. Considerable difference of opinion was expressed on the personal beauty of the women. Beechey moderately writes that their features were regular and well looking without being handsome. The complexion of the women, which was slightly fairer than that of the men through less exposure, was of a "dark gipsy hue." Pipon (74) states that the red tinge common in the skin of the Polynesian was absent. The hair was generally deep black or dark brown and straight, or in some wavy. The women are described as dark-eyed, but many men had hazel eyes, and one or two, blue eyes. The eyebrows were thin and non-concurrent. The nose was somewhat flattened and with a flaring of the

nostrils which was reminiscent of the Tahitian nose. The lips were thick, according to Beechey, and strongly sulcated. The ears were moderately large, with lobes invariably attached to the cheek. Unlike the present-day Norfolk Islanders, the F_1 men did not commonly have a heavy growth of whiskers nor beard,—a feature characteristic of the Tahitian males. The teeth were frequently described as beautifully white and regular, but Beechey states that the teeth of many of the men were disfigured by a deficiency of enamel and by being deeply furrowed. Few of the modern descendants of these people have a complete set of teeth after maturity.

The size of the head was measured during Beechey's stay on the island. He says that the Pitcairn Islanders generally had large heads "elevated in the line of the occiput." The horizontal circumference, taken above the eyebrows, over the ears and around the back of the head in line with the occiputal spine, measured in one individual 22 inches (558.8 mm); in another, 21¾ inches (552.5 mm); and in Polly Young, called "Bighead" 23 inches (534.2 mm). The coronal region was full with a forehead of good height and breadth. The middle of the coronal suture was said to be raised above the surrounding parts.

The general impression gained by most observers of the early Pitcairn Islanders was that they were much more English-looking than Tahitian in the general cast of their features. This is substantially the conclusion reached by visitors to Norfolk Island.

COMPARISON OF NORFOLK ISLANDERS WITH BACK-CROSSED HYBRIDS

In the series of Society Islanders measured by Handy there is a group of 7 males and 8 females who are the progeny of an F_1 (English-Tahitian cross) back-crossed with pure Tahitian. Since the racial elements are similar, it is of interest to compare this group with the Norfolk Islanders, who may, for the purposes of this comparison, be regarded theoretically as equivalent to an F_2 population. The series of back-crossed individuals is too small to do more than briefly compare its averages with those of the Norfolk Islanders. In Table LVIII the means for the back-cross group are given with those of the Norfolk Islanders and pure Tahitians.

In stature, neither the back-cross males nor females equal the average for the Norfolk Islanders. But the average sitting height for the back-cross group is the same as that for the Tahitians. The short head length of the Tahitians is dominant in the back-cross. In fact the slightly smaller averages of the back-cross seem to indicate a strain of short-headedness in the Tahitians more pronounced than that displayed by their mean. The head width of the back-cross group among the males approaches the Norfolk Islanders, while among the females it is intermediate. The males of the back-cross have a minimum frontal diameter which is narrow like the Tahitian type. The face width among the back-cross males is clearly intermediate, but among the females it tends towards the smaller Norfolk mean. In nose width, the back-cross group is again intermediate.

The mean indices for the males in the back-cross series tend in almost every case to approximate the Tahitian means. This is not so pronounced among the females.

In general, the unexposed skin color of the back-cross group approaches closely the pigmentation characteristic of the Tahitians. There were no examples, however, among the back-cross series of the deeper shades found among the Tahitians. The degree of pigmentation of the exposed skin falls within the range for pure Tahitian. From the fact that a definite pinkish tint was observed in several individuals among the back-cross group, it might be concluded that the darker skin color of the Tahitian was not completely dominant.

The eye color of the Tahitians is dominant, for in no individual among the back-cross group was a mixed or blue eye observed.

Similarly in hair color, the back-cross group differs in no way from the Tahitians. Thirteen out of 15 had black hair and 2 reddish brown, a tint which was observed to be present to an appreciable extent among Polynesians in general. No baldness was found and only a very slight tendency to gray hair among the back-cross individuals.

In 11 of the 15, no trace of an epicanthic fold was visible. This low percentage of epicanthus is not what would naturally be expected. Handy recorded a higher percentage of epicanthus for the Tahitians than for other Polynesians, so that if this trait were dominant, as it is found to be elsewhere, a greater incidence of the back-cross trait might be expected. As has been shown, epicanthus is almost completely absent among the Norfolk Islanders. From the data here presented

this character does not appear to be dominant, but this may be the result of differences in standards.

The nasal profile is intermediate to the Tahitian and the Norfolk Island types. With the exception of one convex profile, the back-cross group is characterized by straight noses.

The abundance of body hair growth for the back-cross group is definitely more pronounced than for the Tahitians who are relatively glabrous. Although the degree of hairiness is not so great for the back-cross group as I found among the Norfolk Islanders, the glabrous character of the Tahitians appears to be recessive.

CORRELATION OF TAHITIAN BLOOD WITH INHERITANCE

So far as possible, the individuals of the Norfolk Island series were grouped in classes based on the fraction of Tahitian blood. This could be done with some assurance since the genealogical records are fairly complete from the beginning of the colony down to the present day and may be supplemented by cross references to the journal kept on Pitcairn. The amount of Tahitian blood expressed in fractions of 32ds was correlated with those measurements and indices which seemed likely to give the best results. The males only were used. Four males had genealogies which I was not able to disentangle, and were, therefore, excluded from the series. The following list shows the coefficients obtained:

Head Width	R — .14
Face Width	R — .15
Face Height	R — .16
Minimum Frontal	R — .26
Bigonial	R — .19
Indices:	
Facial	R — .08
Fronto-Parietal	R — .66
Relative Sitting Height	R — .39

Only in the correlation of minimum frontal, fronto-parietal, and relative sitting height are the coefficients of probable significance. It should be remembered that the division on the amount of Tahitian blood is not a substitute for the genetic classification based on back-crossing. The variations in the amount of Tahitian blood, which ranges from 6/32 to 20/32, are due to the fact that two of the first generation males married pure blooded Tahitian women, and that a few intermarriages with English have occurred since the early days. From such a mixture as this, a high degree of correlation between measurement or indices and Tahitian blood should not be expected if human characters are inherited according to Mendelian theories.

SEX DIFFERENCES

In Tables LX and LXI are given the sex differences between the means of the measurements and indices of the Norfolk Islanders, English, and Tahitian. In some of the measurements and indices the sex difference is not the same for both parent stocks. For face width the difference between the sexes among the Tahitians is considerably less than for the English. In this respect the hybrid Norfolk Islanders follow the Tahitian. In face height, however, the Norfolk Islanders have the larger sex difference which characterizes the English. In both the minimum frontal and bigonial diameters the Norfolk sex difference approaches the Tahitian. The similarity between the Norfolk and Tahitian means for both these characters has been noted. In other measurements the contrast is less striking.

VARIABILITY OF NORFOLK ISLANDERS

The Norfolk hybrids are less variable than either the Society Islanders or the British Scientists. The standard deviations of the hybrids, Society Islanders and British, male and female, are recorded in Table LXII. Compared with the Society Islanders, the Norfolk Island males have smaller standard deviations for 16 of 24 measurements. Similarly the male hybrids deviate less from the mean than do the British Scientists. In 13 out of 18 standard deviations compared, the hybrid males have smaller deviations than the group of Scientists. A comparison shows that the hybrid women also are more homogeneous than either the British women or the Society Islands women. For 20 out of a total of 24 measurements, the hybrid women have smaller standard deviations than do the Tahitian females. Apparently the hybrid women as compared with the Tahitian women are more homogeneous than the hybrid men as compared with the Tahitian men. In only 9 out of 18 standard deviations are the hybrid women more homogeneous than the British. But this should be interpreted in the light of the fact that the standard deviations for the British women are based on eleven individuals, with a result that many of the standard deviations are far too low. Especially is this true for the standard deviations for head length, head width, minimum frontal, and cephalic index. Taking this

into consideration, the hybrid woman as well as the man may be assigned a more homogeneous character than either of the two groups used for comparison. This greater homogeneity of the hybrids is to be expected in a mixed population.

Normally, low standard deviations are associated with racially pure strains. The homogeneity of the Norfolk Islanders may be in part explained by the fact that they have been, since the inception of the colony, inbreeding very closely. It must be remembered that the numbers of the original cross were very small, and consequently, the crossing over of family lines has been long continued and very involved. Practically every Norfolk Islander is related to every other islander. In one individual the genealogy showed that for a possibility of four white male great-great-grandparents, there was only one—Fletcher Christian.

The coefficients of variations for males and females are listed in Table LXIII. A comparison of these corroborates the conclusion of the greater homogeneity of the hybrid population.

PHYSIOLOGY AND VITAL STATISTICS

GENEALOGIES

The use of the term "vital statistics" is perhaps too ambitious for the amount of material which it is possible to accumulate on that subject with regard to the Pitcairn and Norfolk islanders. The genealogies, which I arranged from the existing data, are undoubtedly accurate, but a deficiency lies in the fact that they are in some respects incomplete and lack many of the necessary dates which are essential for an adequate handling of the vital statistics of the colony. Some dates, however, were available and were utilized as far as possible. (See pp. 98-106.)

POPULATION

The first report on the number of individuals on Pitcairn comes from Mayhew Folger, who discovered the colony in 1808. He placed the total population at 35 individuals. Of this number, it appears from other sources, 25 were the children of the mutineers and Tahitian women. The remaining number evidently consisted of Adams and the widows of the mutineers. By 1814 the population had increased to 40, and somewhat later to 46, but no date is given for this last figure. It was just at this time that most of the children of the first generation were reaching maturity, so that a rapid rise in the population is to be expected. The next information of the increase in population is from the Island Journal which summarizes at the end of 1839 with the statement that there were 106 individuals, 53 males and 53 females, and that 52 scholars attended the school. Since many of the children were too young to attend school, and were not listed in the total for school children, it appears that less than half of the population were above school age. From then on until 1856, the population increased rapidly until the total amounted to 193, when they were transferred to Norfolk Island. The following data summarize the growth of population. Of the several slight discrepancies in the table, none are serious.

Year	Total	Males	Females	Marriages	Births	Deaths	Scholars	Adult[a] Males	Adult[a] Females
1808	35	....	....	....	....	....	....	....	....
1814	40	....	....	....	....	....	....	....	....
1825	66	36	30	....	....	....	....	....	....
1839	106	53	53	....	....	....	52	....	....
1840	108	53	55	....	....	....	....	17	16
1841	111	54	57	....	7	3	....	21	17
1842	112	53	59	....	3	2	....	20	20
1843	119	59	60	1	6	2	....	20	21
1844	121	60	61	2	5	0	....	26	28
1845	127	65	62	2	7	0	51	....	....
1846	134	69	65	0	7	1	47	....	....
1847	140	72	68	0	6	0	48	....	....
1848	146	74	72	3	7	1	44	....	....
1849	155	76	79	1	10	1	47	....	....
1852	170[b]	....	....	....	....	....	....	....	....
1853	172	85	87	....	....	....	....	....	....
1855	187	92	95	....	....	....	....	....	....
1856	193	94	99	....	....	....	....	40	47

[a] Includes all members of the colony above the age of 18, the legal voting age.
[b] Includes 21 families.

The vital statistics recorded on Norfolk Island at the present time unfortunately include all residents of the island. Besides the descendants of the mutineers of the *Bounty*, there are recent settlers from Australia, the staff of the Cable Station together with their families and until 1919 the Melanesian Mission.

Year	Births	Deaths	Marriages	Population
1916	17	7	2	927
1917	23	12	5	883
1918	11	11	4	815
1919	15	9	3	740
1920	22	11	9	698 ([a])
1922	21	6	3	.....

([a]) Year of the removal of the Melanesian Mission.

It may be noted that for 1918 the births and deaths on Norfolk Island were equal in number, and that in 1920 and 1922 the births again exceed the number of deaths. This is probably accounted for by the fact that many of the young men

enlisted during the World War, and with their return the number of marriages in 1920 increased suddenly. The steady loss of population in the face of the greater number of births over deaths is accounted for by the fact that the total population includes not only the Norfolk Islanders but more or less transient settlers and a shifting Cable Station staff as well as by the fact that many of the young men and women migrate to Australia and New Zealand, where they are attracted by the superior opportunity for advancement, and where most of them settle permanently.

I estimate the number of the Norfolk Islanders themselves as 500 to 600. In 1921 the population of Pitcairn Island was 169, sprung from the few families that returned to the island in 1859. (See p. 8.) With the steady loss of a proportion of the young adults, it is difficult to estimate the total number of descendants from the original cross, but it is clear that the rate of increase has been enormous. The population in 100 years has probably increased much more than tenfold.

FERTILITY

The statistics on the average size of the families is based on genealogical tables (pp. 98-106) which may not be complete for the earlier generations. This defect is balanced to a certain degree by the fact that in the later generations there is a tendency to omit from the record those families which had no issue; some issueless matings are listed but probably some are lacking. The records for the first two generations are probably complete in listing all marriages with or without issue. This, if corrected to include infants who died very young, would tend to increase the average size of the families of the first and second generation and lower that of the later generations. In all cases where an F_1 individual marries an F_2 or other cross cutting of generation lines, the generation of the father is taken for convenience. It should also be pointed out that the average number of offspring of matings of individuals of the fourth generation is probably too low since many of the marriages are very recent. It was impossible to eliminate any of these marriages because the duration of only a few marriages is known. A summary of the record follows:

	Average Number of Offspring	Number of Families
Original Cross	4.17	6
F_1 matings	7.44	9
F_2 matings	9.10	38
F_3 matings	5.39	77
F_4 matings	2.96	26

Very clearly the greatest degree of fertility occurs among the individuals of the second generation with a falling off in the succeeding generation. There was only one barren marriage among the F_2, while there are four at least among F_4. This amazing fruitfulness of the F_2 marriages exceeds that found by Fischer (35) among the Rehobother bastards, who have an average family of 7.7 children. The average of 9.1 children for each F_2 mating exceeds the averages of Dutch families, which range from 5.07 to 8.2. The average size of the Tahitian families is unknown, but it is exceedingly doubtful that it approaches that for the F_2 Pitcairn Islanders. An amazing example of fertility is Maria Christian, who was born in 1815, in the second generation. She married at the age of 14 and had a total of 25 children by three successive husbands! Two of the 25 were twins. From the available records it appears that there have been 5 or 6 sets of twins.

It is clear that race crossing generally results in a greatly increased fertility. Fischer (35), Boas (11) and others have shown that hybrids have a much greater average family than the parent stocks. This is borne out by the fertility of the descendants of the mutineers, but apparently the fertility manifested in the F_2 generation diminished in the later generations. This is not so among the Rehobother bastards, who maintain a high fertility even after 5 or 6 generations, which exceeds that for the fourth generation of Norfolk Islanders. In the first place, it must be remembered that a large percentage of the F_4 matings are recent. Another factor is the spread of the knowledge of contraception which probably plays a large part in the decrease of the size of the present day Norfolk families.

AGE AT MARRIAGE

During the regime of John Adams, who died in 1829, early marriages were frowned upon. Pipon writes that the young women accepted this ruling by his advice "because they knew it to be good." The reason given by Adams for his stand against marriages before eighteen for females was that he felt it to be necessary for the young people to have collected sufficient property in the way of livestock and to have cleared the land before they entered upon matrimony. After marriage the women were, for the most part, confined to the homes, which was a hardship for a young colony where all hands were needed for the cultivation of the soil. All marriages were performed only

with the consent of Adams. The average age of marriage of the F_1 generation was for 8 females, 22.25 years; and for 8 males, 21.25 years. The youngest of the females to marry was 16, and the oldest, 31. The youngest of the males was 18, and the oldest, 24. These averages confirm the fact that Adams was able to restrain very early marriages for the most part. In some marriages there was a great deal of disparity in age, due to the fact that there was a very limited choice of available brides.

The age at marriage of the F_2 generation was considerably lower. The dates of both birth and marriages were available for only 40 individuals of the second generation. The average for 17 females was 16.77 years. The youngest was 13 years old, five were 14 years old, two were 15, and four were 16. The oldest of this generation to marry was 24. For 23 males the average was 20.91 years. The youngest of the males was 15 and the oldest, 30.

The marriage dates for the F_3 generation are very scanty. I have them for only five females and three males. The average age of marriage of the females was 20 years and for the three males 21.67 years. From these meager numbers it would seem that the age at marriage was increasing. It should be observed that the greater fertility of the F_2 generation was also accompanied by a very early marriage age. Unfortunately I have no material on the age at marriage among the later generations, but from my observations on Norfolk, it appears that the very early marriages, characteristic of the F_2 generation, are no longer found. Many of the marriages are late. This is not due to any physiological cause, but to a variety of social and economic influences. The strict social customs which formerly made a very early marriage desirable no longer obtain.

BIRTH AND CARE OF CHILDREN

In the first years of the settlement on Pitcairn it was of course vital that the women be skilled in midwifery, and undoubtedly the Tahitian women were versed in the lore of their native island and passed this knowledge on to their daughters, who, according to Beechey, had all learned the art of midwifery. At the present time on Norfolk Island the major responsibility rests with the resident physician, but on Pitcairn the women still practice midwifery. Parturition, Beechey found, took place generally during the night with a duration of labor seldom exceeding five hours. The modern Norfolk Island women, as far as I was able to determine, have an equally easy delivery. I do not know of any case where the delivery was fatal. In the early days miscarriage, except from accident, was hardly known.

The care of the newly born child on Norfolk Island agrees essentially with modern practice; the Tahitian customs adopted by the early Pitcairn Islanders no longer are in use. Formerly it was the practice to bathe the infant three times a day in cold water. For most infants weaning was delayed for three or four years—a widespread practice among many primitive people. After weaning, the child was fed on *popoe*, made with ripe plantains and boiled taro rubbed into a paste. Teething was not difficult, and the children in general were remarkably healthy and free from many of the childhood complaints.

THE TEETH

There is some variation, both in the order and time of eruption, of the teeth of the Norfolk Islanders. The permanent teeth are commonly extracted at a very early age. In not a single adult individual, who came under my notice, did I observe a complete set of teeth. As early as the age of 15 and 16, the teeth are extracted and at the age of 45 to 50, in nearly all individuals, the entire set is gone. The upper incisors seem usually to be extracted first. The youngest of the males lacking the entire set of permanent teeth, is 34. I am unable to determine the cause for this extraordinary condition, as the islanders have become extremely unwilling to discuss it. For some time attention has been directed toward this condition, and the islanders, like most people, dislike to have their defects mentioned. I was not able to obtain an extracted tooth, but I was informed that many teeth are sound on extraction. The reason given in several cases for the removal of teeth is that they ache, in spite of the fact that they are apparently in excellent condition, usually quite regular and very white. I did not observe any pyorrhea. It might be assumed that the diet of the islanders is responsible for the condition of the teeth, but apparently the diet which is largely of a vegetable nature, with some meat, does not differ essentially from that of other Polynesian people. Conceivably it may originate from inheritance. Edward Young, one of the mutineers, was said to have had very bad teeth and although only 22 years old had already lost several

incisors—precisely the teeth which are frequently removed first among the Norfolk Islanders.

PULSE AND TEMPERATURE

The temperature of the Norfolk Islanders is normal. The men have slightly lower temperatures than the women. Beechey observed that the skin of the Pitcairn Islanders always felt cold compared with his own and that of the other officers on board the *Blossom*. The ships surgeon examined several of the islanders. In the forenoon he found one with a pulse of 60, while three others in the afternoon after dinner were 68,72 and 76. The officers who stood the heat best were all over 80. Beechey also records a fact which impressed me while on Norfolk, that both the men and women in middle life look much younger than would be supposed. It was very difficult to estimate the age from observation. Many men of 60 had the appearance of 50.

LONGEVITY

In 1921 there were 24 individuals listed as surviving from the original group which came from Pitcairn in 1856. Their average age was 73. The youngest was at least 65. Of these 15 were women and 9 men. The superiority of women in regard to longevity is apparent here. Pearl (72) states that this is a characteristic phenomenon. In 1923 the oldest man on the island was David Buffett, who was 95 years old. The oldest woman was 87 and was still remarkably active and in possession of her faculties. An extraordinary example of active old age is Uncle Cornish (Cornelius) Quintal. At the time of this writing (1926) he is still living. Though 83 years of age at the time of my visit (1923) he was accustomed to work in his garden and to mount his own horse and canter about the island visiting his friends. His memory was very good and so keen was his mind that he was still able to play a very effective game of chess. For over four months he accompanied me every day on my field trips from nine in the morning to five or six o'clock in the afternoon, without apparent fatigue.

DISEASE

On the whole, the Pitcairn Islanders were remarkably healthy and free of many of the diseases which ravaged other parts of Polynesia. Beechey reports them as affected by "plethora and boils" in rainy weather and after occasional visits of ships. The first decimation of their numbers occurred in 1831, when for a time they were removed to Tahiti, where fully one-fifth of the 87 immigrants died as a result of an epidemic. The accounts give no symptoms, but it seems probable that some at least succumbed to venereal disease. On Pitcairn itself the first outbreak of a series of epidemics occurred in 1841, when most of the islanders were laid low with "fever attended with a distressing cough." Some of these cases are described as influenza combined with dysentery. Several cases of "inflammatory fever" were reported for 1842, but by that time the epidemic had abated considerably. The next year, 1843, there was another outbreak of fever of an inflammatory type, accompanied by shivering and succeeded by violent pains in the loins and head. Similar cases were reported intermittently until 1845, when another epidemic occurred. This is described as "bilious" with violent pains in the head, burning heat and cramps in the arms and thighs, with a dull pain in the back. This disease lessened in severity, but a few cases are mentioned as late as 1853. All these epidemics appear to be various forms of influenza, with intestinal complications in the later attacks.

With the exception of a rare death by accident, the mortality of the Pitcairn Islanders was very low, even during the worst of the epidemics. Tetanus from accidental wounds was reported rarely. Only one case of cancer was recorded for the Pitcairn Islanders, and though there are more cases among the Norfolk Islanders, the disease is not common. Venereal diseases were unknown in the early days of the colony.

Young (92) describes the outbreak of a new disease as it occurred on Pitcairn in 1880 among the few families which returned from Norfolk in 1856.

> It was during the year 1880 that an unusual and very peculiar visitation appeared among the community, affecting only the younger members, eleven or twelve young persons in all having been subject to it. The disease, if such it may be called, was temporary insanity, the case that lasted the longest not extending over two years. The first symptom of the attack was a strange hallucination of the mind, the person affected seeing some object, which greatly terrified him, or hearing voices calling to him, then gradually losing recollection of all former events, until the mind became an utter blank. One peculiar feature of the disease was a distorted vision, that transformed everything into something different to what it was, as, for instance, a full grown man or woman appearing as but a mere child, while a mere baby would assume the proportions of a man. In almost every case the patient was calm and quiet; the power of speech seemed taken away, while the vacant stare showed that the mind had lost control of itself. One case was that of a youth who had been shipwrecked and whose stay was prolonged

on the island. This was in 1881. One morning he declared that during the night he saw his mother's coffin pass above out of the window, and nothing could persuade him that it was a delusion. A few hours after, he became oblivious to everything that was going on about him, and in the very first stage of the disease was entirely deprived of the power of speech. When speech returned after a few days, he employed himself searching from house to house, looking for a fancied friend, who was unjustly condemned to prison, and whom he was sparing no effort to release. On one occasion he wandered away during the night to the opposite side of the island, where he was found by a party who went in search sleeping under an overhanging rock, wrapped up in his scout's blanket, for at that stage of his derangement he declared that he was Davy Crockett, out on an Indian trail. Davy Crockett was only one out of many different characters he impersonated in the various stages of his disease. Many and various were the phases that the disease assumed, each patient being acted upon in a different manner. There has never been any satisfactory explanation of the cause that produced it. The case mentioned above as being of the longest duration was that of a young girl, whose mind became affected in April, 1884, and was restored in the early part of 1886. Since that time the peculiar disease has not made its appearance.

The remedies of the Pitcairn Islanders before contact was established with the outside world consisted of salt water, hot ginger tea, or abstinence from food according to the nature of the complaint. Later laudanum was frequently used for tetanus or lockjaw. The list of medicaments used by Nobbs included the following: opium, laudanum, tartar emetic, antimonial powder, carbonate of ammonia, sulphate of zinc, sulphate of ether, sulphur, prussic acid, digitalis, Friar's balsam, quinine, gum, camphor, ipecacuanha, Davis's powders, palap, blister salve, bitter aloes, asafoetida, sweet spirits of nitre.

The Health Report for Norfolk Island in 1921 states that the general health was good. There were no epidemics. A medical examination of 120 school children revealed that 50 per cent had palpable glands of the neck, and a larger percentage showed general turgescence of the pharyngeal and nasal mucous membranes. Similarly in 1923, the report states that the health "was remarkably good."

SUMMARY AND CONCLUSIONS

HISTORICAL AND SOCIAL BACKGROUND

Aside from the problems of physical inheritance, the early life of the descendants of the mutineers of the *Bounty* presents an interesting social study. The settlement of English sailors and Tahitian women in 1790 on Pitcairn was followed soon after by a period of murder and crime which resulted in the violent death of all the Tahitian men and all but two of the Englishmen. In 1800, one of the two surviving Englishmen died, leaving as sole adult male survivor John Adams, one of the mutineers. The island was in complete isolation until 1808 and was very rarely visited until after 1825 when the increasing whaling activities of the New England ports brought the islanders into closer contact with the outside world. The early formative years of the colony were, however, passed without influence from American or European sources and the life of the islanders during this period has therefore a great deal of interest. Later much that was peculiarly Pitcairn was lost and today the descendants of the Pitcairn Islanders who were removed to Norfolk Island in 1856 because of the increase of population, are essentially European in their manner of living.

As might be supposed from the origin of the community on Pitcairn, much of the material side of the life was derived from both English and Tahitian sources, but in addition the islanders developed indigenous customs which are of particular importance.

The Tahitian or Polynesian features were introduced to Pitcairn by the Tahitian wives of the mutineers. The dress in the early days of the colony was made of tapa manufactured after the fashion employed in the Society Islands and was worn in a manner modelled on Tahitian usage. Food and even the manner of cooking or roasting in great pits was the same as was found on Tahiti during that period. Other factors which show Tahitian influence are the amusements such as dancing and surf-riding; and also the methods employed in fishing such as the use of the spear and the torch light. Many other Tahitian customs, such as the use of the "doodoee" nuts strung on a palm stem used in lighting and the thatching with lauhala indicate Tahitian influence, but these illustrations show sufficiently the degree to which life on Pitcairn was Polynesian.

The English contributions to the Pitcairn society of these early days were less striking than the Tahitian principally because the life was very primitive and consequently the Tahitian was nearest to its needs and resources. English influences were not lacking however. The village common on Pitcairn with the houses grouped around it was modelled after English villages. Such industries as cabinet and furniture making were English. Most of the implements and utensils

with the exception of those used for tapa making were manufactured on European models.

The native developments include the methods of construction and arrangement of the interior of houses, which were unlike either Tahitian or English, being made of timbers laid vertically and fitted into grooves in the great corner posts and joists. The beds in the large central room were built in like bunks on a ship.

The social relationships of the islanders were remarkable in their solidarity and idyllic quality—resembling a large family with John Adams as a patriarch. The government, too, was a local development. Equal suffrage for all men and women who had attained the age of 18 was striking—advanced at a time when women in England or Europe had no expectations of gaining suffrage. As distinctive was the equal partition of property among all the children, both male and female. Although the religion of the Pitcairn Islanders was patterned on the Church of England it took an exotic form and impassioned version.

ANTHROPOMETRIC METHODS AND RESULTS

Measurements and indices are continuous characters and for that reason do not lend themselves readily to Mendelian analysis. If, however, the mean of the hybrids is markedly similar to one or the other of the parent stocks when the parent stocks themselves are significantly different, there is clear justification for assuming that there is dominance. In most cases the difference between the parent stocks is not great enough to indicate more, as a finer distinction would not be statistically stable in the sense that the statistical checks necessary for series of the size here dealt with would eliminate what might otherwise be valid. A mid-position of the hybrid mean would therefore indicate an apparent blending.

The results of the comparative anthropometric analysis of this study of racial hybrids are summarized in the Table LXIV where for each character listed the hybrids are given a position expressing the relation to the parent groups. For some characters the proper position of the hybrids is difficult to determine, due to discrepancies among the various comparative series used to establish the English or the Tahitian average. For these the evaluation of the hybrid mean is decided by the most representative of the comparative series. The tabulated results (Table LXIV) show clearly that both male and female hybrids resemble the English more closely than they do the Tahitians, and that the females tend more strongly than the males toward a mid-position with respect to the parent groups.

COMPARISON OF SPECIFIC FEATURES

A summary of the anthropometric characters of Norfolk Islanders is shown in Table XXI. The brief comparisons which follow are illustrated in figures 1-11 which give the actual standard derivation of the racial groups plotted from the means as centers. For example, in figure 1 where the mean stature of Norfolk Islanders is shown as 174.00 cm. and the standard deviation as 6.35 cm., the normal deviation would be 167.65 cm. to 180.35 cm. which is represented by a horizontal line.

Stature.—Apparently as a result of heterosis the male hybrids are significantly taller than either parent stock. The Norfolk Island women, however, reach but do not exceed the means for Tahitian and English.

Sitting height.—The mean of the male hybrids does not differ significantly from the English mean but is greater than the Tahitian. The Norfolk Island women are midway between the Tahitian women and the women in the Old American series, the American women being superior to the Tahitian.

Head length.—There is a marked difference between the parent stocks for head length. Both male and female hybrids have clearly inherited the longer head length of the English.

Head width.—For head width the Tahitian mean for males is 6 mm. to 7 mm. greater than the English. The male and female hybrids have inherited a mean which is roughly intermediate, therefore indicating perhaps a multiple factor character as the regulator of head width.

Horizontal head circumference.—The measurements of head circumference for the English are inadequate for comparison. The hybrids are, however, probably not different from either parent stock.

Face width.—The parent groups differ with respect to face width, the Tahitians being wider faced. The hybrids are roughly intermediate, although the males are slightly nearer to the English average than are the females.

Face height.—In face height the male hybrids are not significantly different from the Tahitians. If the series of British Scientists is excluded,

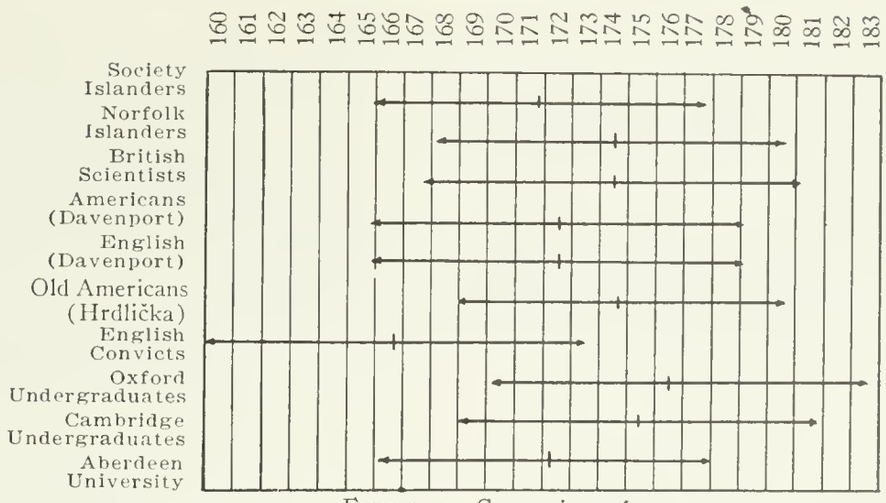

FIGURE 1.—Comparison of statures

In Figs. 1-13, the total horizontal line expresses the range of the standard deviation, the vertical bar on each horizontal line indicates the position of the mean.

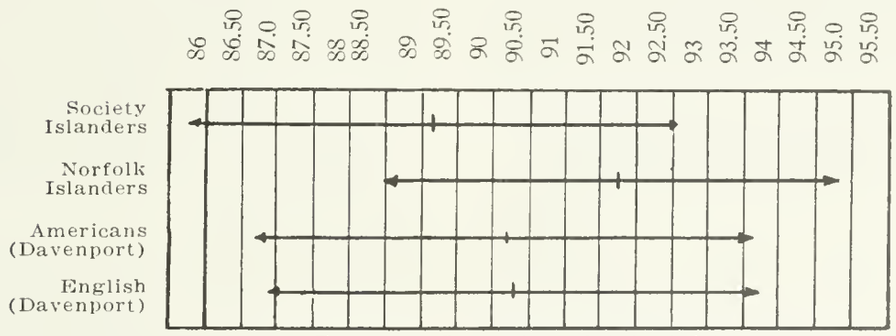

FIGURE 2.—Comparison of sitting heights

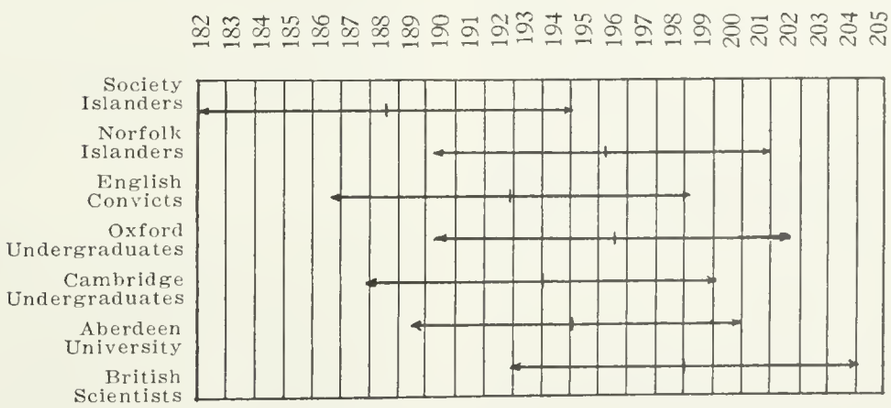

FIGURE 3.—Comparison of maximum head lengths

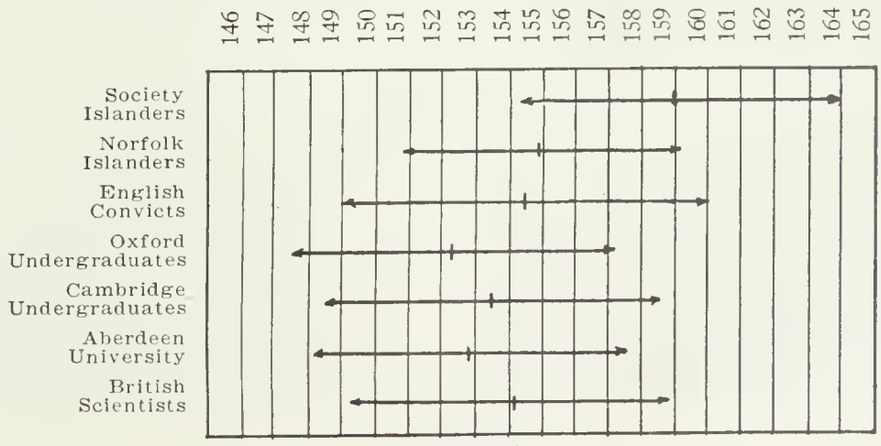

FIGURE 4.—Comparison of head breadths

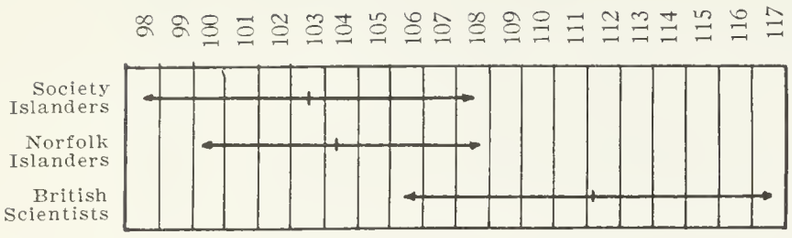

FIGURE 5.—Comparison of minimum frontal diameters

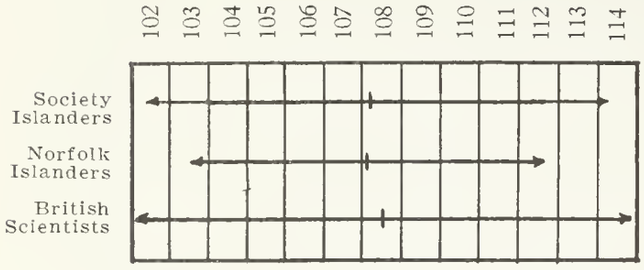

FIGURE 6.—Comparison of bigonial diameters

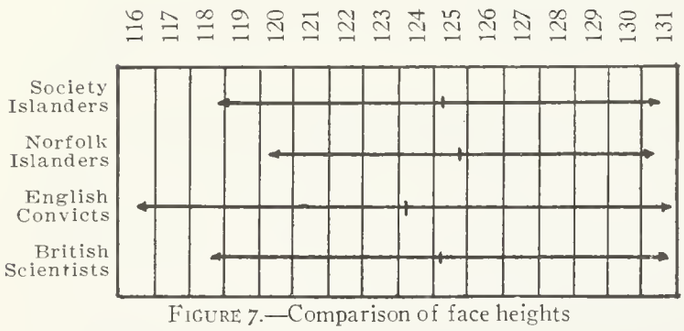

FIGURE 7.—Comparison of face heights

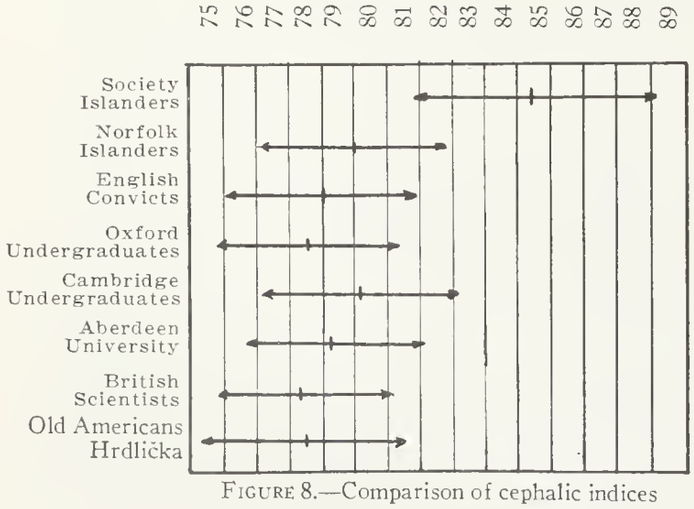

FIGURE 8.—Comparison of cephalic indices

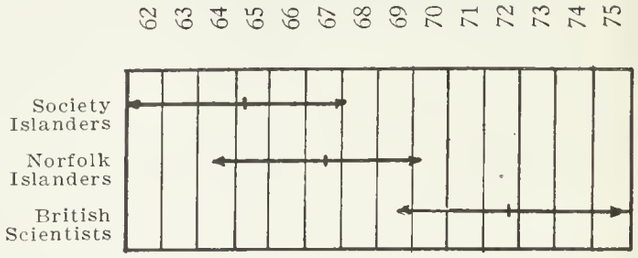

FIGURE 9.—Comparison of fronto-parietal indices

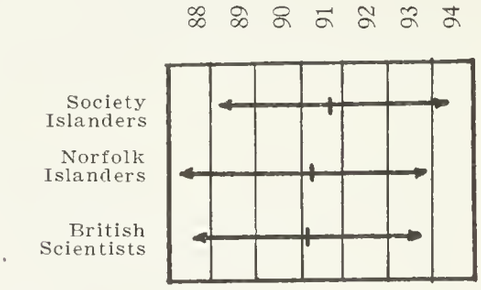

FIGURE 10.—Comparison of cephalo-facial indices

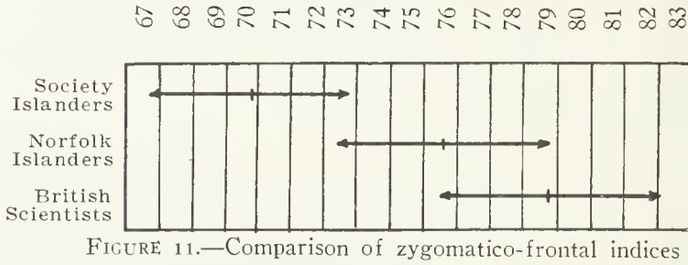

FIGURE 11.—Comparison of zygomatico-frontal indices

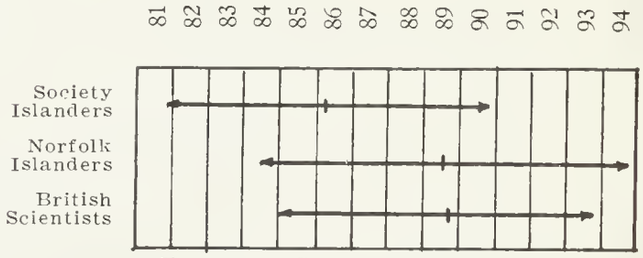

FIGURE 12.—Comparison of facial indices

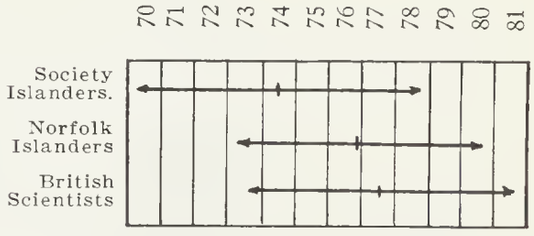

FIGURE 13.—Comparison of zygomatico-gonial indices

the hybrids may be said to have inherited the greater face height of the Tahitians, and if the Scientists are regarded as representative, the difference between the parent stocks is wiped out. The females are intermediate.

Minimum frontal diameter.—The hybrid males have inherited a narrow forehead which resembles the Tahitian. Apparently the minimum frontal diameter of the Tahitians is partially dominant. Due to the lack of differentiation between the women of the parent stocks the female hybrids are not significantly variant from either.

Bigonial.—In bigonial diameter the hybrids do not differ from the parent groups who themselves are very similar.

Nose height.—Because of the difficulty of locating nasion and the large personal equation involved, the conclusions for nasal height are made with reservations. The male hybrids have a mean nose height which is greater than the Tahitian and the Old Americans, intermediate between the Tahitian and the British Scientists. The female hybrids do not differ from the Tahitian or English means with the exception of the Old Americans series.

Nose width.—For nose width both the male and female hybrids are intermediate, with a tendency to approach the smaller mean of the English.

Relative sitting height.—The male hybrids have inherited the relatively longer bodies of the English, which apparently are dominant. The females are intermediate.

Cephalic index.—With respect to cephalic index, the Tahitians are pronounced brachycephals; the English low mesocephals. The hybrids have inherited a mean which is much nearer the English than the Tahitian, a fact which apparently indicates that the English mean is dominant.

Facial index.—In facial index, the male hybrids are very close to the English, who are narrower faced than the Tahitians. The females also approximate the English mean although the difference from the Tahitian women is not great.

Cephalo-facial index.—The male hybrids do not differ significantly from the males of the parent stocks, who in turn, do not differ between themselves. The females of the English and Tahitian groups are more divergent. The Norfolk women are intermediate but slightly nearer to the lower English mean.

Fronto-parietal index.—With respect to fronto-parietal index, the hybrid males are roughly intermediate to the parent stocks but slightly nearer to the lower mean of the Tahitians. The inadequate comparative data for the females suggests that they may be placed in an intermediate position.

Zygomatico-frontal. — For zygomatico-frontal index the Tahitian mean is distinctly lower than the English. Both the males and females of Norfold Island are intermediate.

Zygomatico-gonial.—For zygomatico-gonial index both males and females of Norfolk Island approach the English mean much more closely than the lower mean of the Tahitians.

Nasal index.—The difference between the parent stocks for nasal index is very great. For both the male and female hybrids the index is significantly greater than the English and smaller than the Tahitian. It tends more toward the English, especially among the females.

Eye color.—The distribution of eye color among the hybrids suggests a unit factor character for eye color. The "mixed" eye assumes, however, an importance which to a large extent has been overlooked in previous studies. The pigmented eye of the Society Islanders is, however, clearly dominant over the unpigmented eye, and to that extent agrees with the work of previous investigators. The males have a greater percentage of blue eyes than do the females.

Epicanthic fold.—The epicanthic fold is rare among the hybrids, in spite of the fact that it apparently is frequent among the Tahitians, and said to be dominant. This peculiarity of the inheritance of epicanthic fold is best explained as the result of the personal equation of the observer who over-emphasized the amount of epicanthus among the Society Islanders. This conclusion is borne out by the fact that the Samoans and Tongans, who in other respects appear to be more Mongoloid than the Tahitians, have a very much less incidence of the epicanthic fold.

Skin color.—The unexposed skin color of the hybrids is intermediate to the medium dark skinned Tahitians and the relatively fair skinned English, with an overlapping on the skin color of the parent groups. This appears from the distribution to be the result of a multiple factor character for skin color. The heavier pigmentation of the Tahitians is latent, however, among the hybrids, as their exposed skin color is as dark as the exposed skin of the Society Islanders.

Hair color.—Among the hybrids the dark hair of the Tahitians is dominant over the lighter hair of the English. The small incidence of pure blonde or light hair among the Norfolk Islanders may be due either to the fact that the hair color is controlled by a multiple factor or more probably that the English sailors were heterozygous for hair color. The percentage of red brown hair among the hybrids suggests that red or red brown is a unit factor character and recessive to brown. The prevalence of early graying of the hair among the hybrids is clearly the dominance of the English characteristic. The gray hair among the hybrids appears somewhat later than among the English. Similarly the incidence of baldness among the hybrids is the dominance of an English trait. Baldness is extremely rare among the Society Islanders.

Hair form.—Among the Society Islanders curved hair appears to be dominant over straight hair type. The distribution of the hair forms among the hybrids is very similar to that for the Society Islanders.

Hair growth.—The hybrid males are much more hairy than the Tahitians, who are relatively glabrous. Bodily hairiness is dominant among the hybrids but due to the lack of statistics for the English it is impossible to determine to what extent it is an English characteristic.

Forehead.—The hybrid males are very similar to the Tahitians in the slope of the forehead, with a dominance of the moderately sloping brow as contrasted with the Old Americans who have mainly vertical brows. As expected from the dominance of the Tahitian type of slope, the prominent glabella of the Tahitians is dominant among the males. The female hybrids do not conform to the Tahitian distribution for prominence of glabella so closely as the males, but are more variable.

Nose.—The nasal profile of the hybrids indicates the dominance of the convex types over the straight profile of the Tahitians. The elevation of the nasal bridge is predominantly high for the male hybrids. The meager comparative data for the English suggest a dominance of the English type. This is less marked for the females. The axis of the nostrils appears to be intermediate, although comparative material for the English is also lacking here.

Chin.—Although the parent stocks do not differ strikingly in the prominence of the chin, the male hybrids have segregated with a smaller percentage of medium than either parent stock. This suggests a difference between the parent groups which is not made apparent by the statistical description. For the females the difference between the parent groups is greater with the female hybrids intermediate in character without the dominance of either.

Parent stocks and Norfolk hybrids.—A comparison of the means of the Norfolk hybrids with those of the various English and Tahitian groups reveals that by the test of significant differences the British Scientists approach more nearly to the hybrids as a group than do the Tahitians. But the Scientists are not representative of the average English population. The English Convicts are more widely divergent from the hybrids than are the Society Islanders. Old Americans as a group also are less similar to the hybrids than are the Tahitians except for indices. Other groups such as the American Soldiers are very divergent.

Correlation with Tahitian blood. — A correlation of percentage of Tahitian blood with dimensions and indices reveals that in only minimum frontal diameter, fronto-parietal index, and relative sitting height is there an appreciable correlation.

Variability.—The variability of the hybrids of the Norfolk Islands is less than that for either parent stock. This unexpected greater homogeneity of the hybrids contrasted with the English and Tahitians may be explained by the long continued and extensive inbreeding among the islanders.

Physiology and vital statistics.—The population of Norfolk Island increased very rapidly from the early days of the colony. The fertility reached the surprising maximum in the F_2 generation of 9.1 children for each mating. This great fertility decreased in the later generations, probably as the result of such factors as changed social conditions and the knowledge of contraception. Together with the greater fertility of the F_2 generation was a very early age of marriage,—16.77 years for the females and 20.91 for the males. In the later generations the age at marriage increased. The hybrids are subject to a very early loss of their teeth which is complete while still comparatively young. The cause is unknown. The number of old inhabitants is fairly large, the oldest in 1923

being 95 years of age. In general, the health of the Norfolk Islanders is good, although they have been subject to the world wide epidemics of influenza.

This study of race mixture on the whole rather definitely shows that the crossing of two fairly divergent groups leads to a physical vigor and exuberance which equals if not surpasses either parent stock. My study of the Norfolk Islanders shows that this superiority is not an ephemeral quality which disappears after the F_1 or F_2 generation, but continues even after five generations. Furthermore, the close inbreeding which the Norfolk hybrids have practiced has not led to physical deterioration.

This conclusion regarding the physical vigor of the Norfolk hybrids applies also to their social structure, which on Pitcairn was not only superior to the society instituted by the Englishmen themselves, but also contained elements of successful originality and adaptability. Although the Norfolk Island society is much influenced by European contacts, it has maintained itself,—a fact which acquires increased significance in view of the deterioration of the fiber of Polynesian life as the result of European influences.

EXPLANATION OF TABLES

In Tables I to LXIV the comparative series are referred to as follows. (The numbers in parentheses refer to the bibliography on pp. 96-97.)

Aberdeen: Records of undergraduates of Aberdeen University, quoted by E. Schuster (79).

Americans: Records of Americans, measured by R. B. Bean (4).

American Soldiers: Records of 96,239 American soldiers studied by C. B. Davenport and A. G. Love (28).

Anglo-Scotch: Records of Anglo-Scotch studied by John Beddoe. See Hrdlička (49).

British: 11 women measured by Emma and Felix von Luschan (57).

Cambridge: Records of undergraduates of Cambridge University. Quoted by W. R. MacDonell (58).

Commission: Records of Englishmen, published by C. Roberts and R. W. Rawson (76).

Convicts: Records of English Convicts studied by Charles Goring (42).

Drafted: Records of drafted engineers from various American localities measured by Aleš Hrdlička (49).

English (Baxter): Records of Americans of English nativity studied during the Civil War by J. H. Baxter (3).

English (Beddoe): Records of English measured by John Beddoe. See Hrdlička (49).

English (Davenport): Records of Englishmen studied by C. B. Davenport (28).

English (Galton): Records of Englishmen studied by Francis Galton (40).

English (Hrdlička): Records of English measured by Aleš Hrdlička (49).

English (Parsons): Records of Englishmen studied by F. G. Parsons (71).

Engineers: Records of American engineers measured in Virginia by Aleš Hrdlička (49).

Gros: Records of Tahitians measured by H. Gros (43).

Irish (Davenport): Records of Irish measured by C. B. Davenport (28).

Irish (Hrdlička): Record of Irish immigrants measured by Aleš Hrdlička (49).

Laboratory: Records of Old Americans, laboratory series, measured by Aleš Hrdlička (49).

Military: Records of English soldiers studied by John Beddoe (5).

Moorfields: Records of 107 skulls studied by W. R. MacDonell (60).

Mutineers: Records of 6 mutineers given by John Barrow (2).

Norfolk: Records of 113 descendants of the mutineers now living on Norfolk Island studied by H. L. Shapiro for the present work.

Old Americans: Records of old Americans, total series measured by Aleš Hrdlička (49).

Oxford: Records of 959 undergraduates of Oxford University measured by E. Schuster (79).

Professional: Records of English professional men (76).

Royal Engineers: Records of English Royal Engineers measured by Crewdson Benington (8).

Scientists: Records of 84 British scientists measured by Emma and Felix von Luschan (57).

Scotch (Beddoe and Venn): Scotch measured by John Beddoe and Venn. See Hrdlička (49)

Scotch (Davenport): Records of 2,074 Scotchmen measured by C. B. Davenport (28).

Society: Records of 153 Society Islanders measured by E. S. Craighill Handy (44) and analyzed by H. L. Shapiro for the present work.

ten Kate: Records of 25 Tahitians studied by Herman F. C. ten Kate (86).

Tennessee: Records of 133 Tennessee of "old American" ancestry measured by Aleš Hrdlička (49).

Univ. College Staff: Records of University College Staff given by Karl Pearson (55).

Virginia: Records of Virginians measured by Aleš Hrdlička (49). (See Engineers.)

Whitechapel: Records of 277 skulls studied by W. R. MacDonell (59).

In the tables the following abbreviations have been used:

S. D.: standard deviation.

V. : coefficient of variation.

TABLE I. STATURE

Group	MALES Number	Range	Mean	S. D.	V.	FEMALES Number	Range	Mean	S. D.	V.
.....	11	.....	172.39	.....	.....	....	.....	.....	.....	.....
.....	14	.....	172.8	.....	.....	11	.....	159.1	.....	.....
.....	85	157-183	171.35±0.43	5.91±0.31	3.45±0.18	68	150 -175	161.12±0.43	5.21±0.30	3.23±0.19
.....	64	159-186	174.00±0.54	6.35±0.38	3.65±0.22	49	152.7-174.3	161.72±0.49	5.04±0.34	3.11±0.21
rs.....	6	165-178	170.61	.....	.....	....	.....	.....	.....	.....
.....	2,984	.....	166.29±0.10	6.76	4.06	....	.....	.....	.....	.....
.....	959	.....	176.50±0.14	6.61	3.75	....	.....	.....	.....	.....
ge.....	1,000	.....	174.9 ±0.14	6.46±0.10	3.69	....	.....	.....	.....	.....
n.....	493	.....	171.7 ±0.18	5.94±0.13	3.46	....	.....	.....	.....	.....
s.....	84	156-190	173.98±0.50	6.83±0.36	3.93±0.20	....	.....	.....	.....	.....
n Soldiers.....	6,239	.....	171.99	6.66	3.87	....	.....	.....	.....	.....
(Baxter).....	16,196	.....	169.11	.....	.....	....	.....	.....	.....	.....
Davenport).....	2,074	.....	172.54	6.39	3.70	....	.....	.....	.....	.....
(Davenport).....	4,204	.....	172.08±0.07	6.62	3.84	....	.....	.....	.....	.....
ericans.....	727	154-193	174.32±0.15	5.80±0.10	3.33±0.06	212	145.5-177.3	161.83	5.39	3.33
sion.....	6,194	.....	171.2	.....	.....	....	.....	.....	.....	.....
(Galton).....	811	.....	172.47	.....	.....	....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	11	157-175	165.27±1.16	5.69±0.82	3.44±0.49

TABLE II. SITTING HEIGHT

Group	MALES Number	Range	Mean	S. D.	V.	FEMALES Number	Range	Mean	S. D.	V.
Kate.....	14	.....	88.21	.....	.....	11	.....	81.74	.....	.....
ciety.....	85	80-97	89.40±0.25	3.43±0.18	3.84±0.20	68	64-94	83.88±.40	4.85±.28	5.78±.33
rfolk.....	64	84-101	91.93±0.27	3.15±0.19	3.43±0.20	47	79.8-93.9	85.66±.34	3.41±.24	3.99±.28
boratory.....	247	.....	92.3	.....	.....	....	.....	.....	.....	.....
nnessee.....	133	.....	92.3	.....	.....	....	.....	.....	.....	.....
gineers.....	347	.....	91.2	.....	.....	....	.....	.....	.....	.....
d Americans (Average).....	.....	.....	91.8	.....	.....	....	.....	.....	.....	.....
nerican Soldiers.....	96,239	.....	90.39	3.51	3.88	....	.....	.....	.....	.....
glish (Davenport).....	4,199	.....	90.63	0.04 3.45	3.8	....	.....	.....	.....	.....
otch (Davenport).....	2,074	.....	90.75	3.47	3.8	....	.....	.....	.....	.....
nerican (Bean).....	2,066	.....	90.8	.....	.....	....	.....	.....	.....	.....
ofessional.....	364	.....	91.5	.....	.....	....	.....	.....	.....	.....
xford.....	.....	.....	92.9	.....	.....	....	.....	.....	.....	.....
nglish (Galton).....	1,013	.....	91.44	.....	.....	....	.....	.....	.....	.....
d Americans.....	.....	.....	.....	.....	.....	211	.....	87.27	.....	.....

TABLE III. MAXIMUM HEAD LENGTH

Group	MALES Number	Range	Mean	S. D.	V.	FEMALES Number	Range	Mean	S. D.	V.
Gros.....	10	.....	185.2	.....	.....	....	.....	.....	.....	.....
ten Kate.....	14	180-202	191.0	.....	.....	11	169-189	179.0	.....	.....
Society.....	85	172-203	188.01±0.48	6.54±0.34	3.48±0.18	68	160-191	178.85±0.52	6.31±0.36	3.53±0.20
Norfolk.....	64	184-221	195.59±0.49	5.82±0.35	2.98±0.18	49	173-199	185.61±0.52	5.39±0.37	2.90±0.20
Convicts.....	2,348	.....	192.45±0.09	6.39	3.32	....	.....	.....	.....	.....
Oxford.....	959	.....	196.05±0.14	6.23	3.18	....	.....	.....	.....	.....
Cambridge.....	1,000	.....	193.5 ±0.13	6.16±0.09	3.18	....	.....	.....	.....	.....
Aberdeen.....	493	.....	194.8 ±0.17	5.73±0.12	2.94	....	.....	.....	.....	.....
Commission.....	.....	.....	198.8	.....	.....	....	.....	.....	.....	.....
University College Staff.....	25	.....	196.4	.....	.....	....	.....	.....	.....	.....
Royal Engineers.....	106	.....	194.9	.....	.....	....	.....	.....	.....	.....
Scientists.....	84	180-216	198.51±0.45	6.16±0.32	3.10±0.16	....	.....	.....	.....	.....
Laboratory and Virginia.....	594	.....	197.6	.....	.....	....	.....	.....	.....	.....
Tennessee.....	133	.....	195.0	.....	.....	....	.....	.....	.....	.....
Whitechapel.....	137	.....	197.06±0.36 [a]	.....	.....	140	.....	188.36±0.35[a]	6.22±0.25	3.45±0.14
Moorfields.....	44	.....	197.15±0.57 [a]	.....	.....	63	.....	191.36±0.51[a]	6.02±0.36	3.28±0.20
English (Parsons).....	8,527 [b]	.....	193.64	.....	.....	....	.....	.....	.....	.....
British.....	.....	.....	.....	.....	.....	11	184-194	188.55±0.57	2.78±0.40	1.47±0.21
Old Americans.....	.....	.....	.....	.....	.....	210	173-201	186.2	.....	.....

[a] Figure obtained by adding 8 mm. to the skull measurement.
[b] Calculated from the means given by Parsons (71).

TABLE IV. MAXIMUM HEAD WIDTH

Group	MALES Number	Range	Mean	S. D.	V.	FEMALES Number	Range	Mean	S. D.	V.
ten Kate	14	154-178	161.9	.....	.....	11	.....	152.7	.....	.....
Gros	10	.....	152.4	.....	.....	....	.....	.....	.....	.....
Society	85	146-173	159.58±0.36	4.96±0.26	3.11±0.16	68	145-174	154.13±0.45	5.46±0.32	3.54±0.20
Norfolk	64	142-168	155.47±0.37	4.34±0.26	2.79±0.17	49	142-165	150.61±0.47	4.84±0.33	3.21±0.22
Convicts	2,348	.....	155.02±0.08	5.48	3.63	....	.....	.....	.....	.....
Royal Engineers	106	.....	151.1	.....	.....	....	.....	.....	.....	.....
Oxford	1,000	.....	152.84±0.10	4.92	3.21	....	.....	.....	.....	.....
Cambridge	1,000	.....	154.0±0.11	5.06±0.08	3.29	....	.....	.....	.....	.....
Aberdeen	493	.....	153.4±0.14	4.69±0.10	3.06	....	.....	.....	.....	.....
University College Staff	25	.....	153.5	.....	.....	....	.....	.....	.....	.....
Commission	.....	.....	155.0	.....	.....	....	.....	.....	.....	.....
Scientists	84	145-166	154.55±0.35	4.73±0.25	3.06±0.16	....	.....	.....	.....	.....
Laboratory and Virginia	594	138-170	154.5	.....	.....	....	.....	.....	.....	.....
Tennessee	133	140-165	151.0	.....	.....	....	.....	.....	.....	.....
Old Americans (Average)	727	.....	153.86	.....	.....	....	.....	.....	.....	.....
Whitechapel	135	.....	150.67±0.31 [a]	5.28±0.22	3.75±0.15	140	.....	144.68±0.27 [a]	4.77±0.19	3.54±0.14
Moorfields	46	.....	153.02±0.53 [a]	5.31±0.37	3.71±0.26	62	.....	147.60±0.45 [a]	5.28±0.32	3.84±0.23
English (Parsons)	8,527	.....	151.43 [b]	.....	.....	....	.....	.....	.....	.....
British	.....	.....	.....	.....	.....	11	145-155	149.00±0.65	3.19±0.46	2.14±.31
Old Americans	.....	.....	.....	.....	.....	210	137-161	148.0	.....	.....

[a] Figure obtained by adding 10 mm. for soft parts
[b] Calculated from means given by Parsons (71).

TABLE V. HEAD CIRCUMFERENCE

Group	MALES Number	Range	Mean	S. D.	V.	FEMALES Number	Range	Mean	S. D.	V.
Gros	6	.....	563.3	.....	.....	1	.....	538.0	.....	.....
Norfolk	63	537-603	565.17±1.14	13.36±0.80	2.36±0.14	49	518-600	555.22±1.47	15.22±1.04	2.74±0.19
British	83	540-630	573.7 ±1.27	17.1 ±0.9	2.98±0.16	5	545-566	553.2 ±2.15	7.14±1.52	1.29±0.28
Convicts	2,344	.....	559.72±0.22	15.73	2.81	....	.....	.....	.....	.....

TABLE VI. MAXIMUM BIZYGOMATIC DIAMETER

Group	MALES Number	Range	Mean	S. D.	V.	FEMALES Number	Range	Mean	S. D.	V.
ten Kate	14	136-156	147.1	.....	.....	11	.....	136.2	.....	.....
Gros	10	.....	140.0	.....	.....	....	.....	.....	.....	.....
Society	85	131-160	145.72±0.38	5.13±0.27	3.52±0.18	68	125-150	138.94±0.41	4.96±0.29	3.57±0.21
Norfolk	64	130-155	140.88±0.44	5.25±0.31	3.73±0.22	49	125-148	133.98±0.45	4.72±0.32	3.52±0.24
Convicts	2,348	.....	137.51±0.08	5.64	4.10	....	.....	.....	.....	.....
Scientists	84	130-155	140.02±0.38	5.11±0.27	3.65±0.19	....	.....	.....	.....	.....
Laboratory	247	127-152	138.6	.....	.....	....	.....	.....	.....	.....
Engineers	256	.....	139.6	.....	.....	....	.....	.....	.....	.....
Drafted	91	.....	139.8	.....	.....	....	.....	.....	.....	.....
Tennessee	132	.....	136.5	.....	.....	....	.....	.....	.....	.....
Old Americans (Average)	726	.....	138.7	.....	.....	....	.....	.....	.....	.....
English (Hrdlička)	20	.....	138.5	.....	.....	....	.....	.....	.....	.....
Irish (Hrdlička)	35	.....	138.0	.....	.....	....	.....	.....	.....	.....
Whitechapel	43	.....	138.05±0.57 [a]	5.57±0.40	4.28±0.31	33	.....	128.27±0.58 [a]	4.97±0.41	4.13±0.34
Moorfields	7	.....	137.00±1.19 [a]	4.65±0.84	3.60±0.65	18	.....	130.00±0.69 [a]	4.32±0.49	3.54±0.40
British	....	.....	.....	.....	.....	11	123-139	131.45±1.07	5.25±0.75	3.99±0.57
Old Americans	....	.....	.....	.....	.....	210	120-146	129.9	.....	.....

[a] Figure obtained by adding 8 mm. to the skull measurement.

TABLE VII. FACE HEIGHT

Group	MALES Number	Range	Mean	S. D.	V.	FEMALES Number	Range	Mean	S. D.	
Society	85	111-138	124.78±0.46	6.35±0.33	5.09±0.26	68	104-133	118.47±0.54	6.66±0.39	5.62
Norfolk	64	112-139	125.30±0.47	5.54±0.33	4.42±0.26	49	100-133	115.51±0.63	6.52±0.44	5.64
Convicts	2,348	.....	123.73±0.11	7.70	6.22	....	.....	.....	.....	....
Scientists	84	108-141	124.77±0.49	6.62±0.35	5.31±0.28	....	.....	.....	.....	....
Old Americans	726	.....	121.8	.....	.....	210	98-132	110.9	.....	....
English (Hrdlička)	20	.....	121.9	.....	.....	....	.....	.....	.....	....
Irish (Hrdlička)	35	.....	121.1	.....	.....	....	.....	.....	.....	....
British	....	.....	.....	.....	.....	11	101-121	113.82±1.20	5.91±0.85	5.19

TABLE VIII. MINIMUM FRONTAL DIAMETER

	MALES					FEMALES				
	Number	Range	Mean	S. D.	V.	Number	Range	Mean	S. D.	V.
	10	.....	102.6	.....	.....	....	.....	.....	.....	.....
	85	89-115	102.93±0.37	4.99±0.26	4.85±0.25	67	93-112	101.43±0.35	4.32±0.25	4.26±0.25
	64	93-118	104.00±0.37	4.38±0.26	4.21±0.25	49	95-113	102.82±0.44	4.61±0.31	4.48±0.31
	84	98-130	111.58±0.42	5.65±0.29	5.06±0.26	....	.....	.....	.....	.....
y	247	93-119	105.9	.....	.....	....	.....	.....	.....	.....
bel	132	.....	106.02±0.25 [a]	4.20±0.17	4.29±0.1	93	.....	101.12±0.23 [a]	4.23±0.17	4.55±0.18
s	47	.....	106.47±0.41 [a]	4.12±0.29	4.19±0.29	64	.....	103.16±0.34 [a]	4.05±0.24	4.25±0.25
	....	.....	.....	.....	.....	11	100-115	108.36±0.74	3.65±0.52	3.37±0.48
icans	....	.....	.....	.....	.....	210	90-112	101.2	.....	.....

e obtained by adding 8 mm. to the skull measurement. See Keith (53, p. 131); also Martin (61, pp. 417-418).

TABLE IX. BIGONIAL DIAMETER

	MALES					FEMALES				
	Number	Range	Mean	S. D.	V.	Number	Range	Mean	S. D.	V.
	14	100-118	109.3	.....	.....	11	.....	99.4	.....	.....
	10	.....	104.8	.....	.....	....	.....	.....	.....	.....
	85	92-121	107.76±0.45	6.11±0.32	5.67±0.29	68	88-116	102.60±0.56	6.83±0.39	6.66±0.39
	64	98-120	107.64±0.39	4.66±0.28	4.33±0.26	49	93-114	102.22±0.40	4.20±0.29	4.11±0.28
	84	97-127	108.02±0.47	6.45±0.34	5.97±0.31	....	.....	.....	.....	.....
ry	247	90-126	106.3	.....	.....	....	.....	.....	.....	.....
	....	.....	.....	.....	.....	11	94-111	101.09±1.06	5.20± .75	5.14± .74
ricans	....	.....	.....	.....	.....	210	85-113	98.4	.....	.....

TABLE X. NOSE HEIGHT

	MALES					FEMALES				
	Number	Range	Mean	S. D.	V.	Number	Range	Mean	S. D.	V.
	10	.....	52.5	.....	.....	....	.....	.....	.....	.....
	14	.....	51.2	.....	.....	11	.....	46.4	.....	.....
	85	46-62	54.21±0.26	3.51±0.18	6.47±0.33	68	45-67	52.12±0.32	3.87±0.22	7.43±0.43
	64	47-63	55.38±0.27	3.26±0.19	5.88±0.35	49	45-61	52.27±0.35	3.67±0.25	7.02±0.48
(Hrdlička)	....	.....	54.0	.....	.....	....	.....	.....	.....	.....
rdlička)	....	.....	51.9	.....	.....	....	.....	.....	.....	.....
s	84	46-65	56.30±0.28	3.84±0.20	6.82±0.35	....	.....	.....	.....	.....
ericans	247	43-63	53.8	.....	.....	210	42-61	49.4	.....	.....
	....	.....	.....	.....	.....	11	48-61	52.55±0.81	3.98±0.57	7.57±1.09

TABLE XI. NOSE WIDTH

	MALES					FEMALES				
	Number	Range	Mean	S. D.	V.	Number	Range	Mean	S. D.	V.
	10	.....	36.9	.....	.....	....	.....	.....	.....	.....
	14	.....	40.9	.....	.....	11	.....	35.7	.....	.....
	85	37-48	43.40±0.20	2.77±0.14	6.38±0.33	68	32-51	39.97±0.27	3.31±0.19	8.28±0.48
	64	31-45	37.56±0.24	2.79±0.17	7.43±0.44	49	29-40	34.76±0.26	2.74±0.19	7.88±0.54
	84	28-42	35.71±0.21	2.86±0.15	8.01±0.42	....	.....	.....	.....	.....
ts	247	30-43	36.1	.....	.....	210	28-38	32.5	.....	.....
ericans	347	.....	34.7	.....	.....	....	.....	.....	.....	.....
rs	16	.....	34.8	.....	.....	....	.....	.....	.....	.....
see	....	.....	35.3	.....	.....	....	.....	.....	.....	.....
ericans (Average)	....	.....	34.8	.....	.....	....	.....	.....	.....	.....
(Hrdlička)	....	.....	34.8	.....	.....	....	.....	.....	.....	.....
Hrdlička)	....	.....	.....	.....	.....	11	28-40	32.82±0.63	3.10±0.45	9.45±1.36
s										

TABLE XII. RELATIVE SITTING HEIGHT

Group	MALES Number	Range	Mean	S. D.	V.	FEMALES Number	Range	Mean	S. D.	V.
ten Kate	14	.....	51.05 [a]	.....	.....	11	.....	51.38	.....	.....
Society	85	47.50-55.50	52.18±0.12	1.58±0.08	3.03±0.16	66	49-55.50	52.46±.13	1.59±.09	3.03±.18
Norfolk	64	50.00-56.00	52.81±0.11	1.34±0.08	2.54±0.15	48	50.50-56.60	53.16±.12	1.23±.08	2.31±.16
Old Americans	....	.....	.....	.....	.....	210	50.7 -58.6	53.92	.....	.....
Laboratory	247	50.2 -57.4	52.94	.....	.....	....	.....	.....	.....	.....
Tennessee	133	.....	52.97	.....	.....	....	.....	.....	.....	.....
Engineers	347	.....	52.30	.....	.....	....	.....	.....	.....	.....
Old Americans (Average)	727	.....	52.64	.....	.....	....	.....	.....	.....	.....
Americans (Bean)	2,066	.....	52.4	.....	.....	....	.....	.....	.....	.....
American Soldiers	96,239	.....	52.56	.....	.....	....	.....	.....	.....	.....
English (Davenport)	4,199	.....	52.67	.....	.....	....	.....	.....	.....	.....
Scotch (Davenport)	2,074	.....	52.60	.....	.....	....	.....	.....	.....	.....
Irish (Davenport)	6,137	.....	52.79	.....	.....	....	.....	.....	.....	.....
English (Galton)	.....	.....	53.02 [a]	.....	.....	....	.....	.....	.....	.....
Oxford	.....	.....	52.63 [a]	.....	.....	....	.....	.....	.....	.....

[a] Index of the means.

TABLE XIII. CEPHALIC INDEX

Group	MALES Number	Range	Mean	S. D.	V.	FEMALES Number	Range	Mean	S. D.	V.
ten Kate	14	78.2-90.5	84.5	.....	.....	11	.....	85.0	.....	.....
Gros	10	78.4-88.3	86.71	.....	.....	....	.....	.....	.....	.....
Society	85	74 -94	87.96±0.28	3.84±0.20	4.52±0.23	68	76–97	86.2±0.31	3.82±0.22	4.43±
Norfolk	64	66.1-84.2	79.54±0.24	2.86±0.17	3.60±0.21	49	76.30–90.40	81.16	2.61	3.22
Convicts	2,348	.....	78.52±0.04	3.00	3.82	....	.....	.....	.....	.....
Oxford	959	.....	78.02	2.92	3.74	....	.....	.....	.....	.....
Cambridge	1,000	.....	79.60±0.06	3.00±0.04	3.77	....	.....	.....	.....	.....
Aberdeen	493	.....	78.8 ±0.09	2.79±0.06	3.54	....	.....	.....	.....	.....
Commission	....	.....	78.0	.....	.....	....	.....	.....	.....	.....
University College Staff	25	.....	78.2	.....	.....	....	.....	.....	.....	.....
Scotch (Beddoe and Venn)	....	.....	77.8	.....	.....	....	.....	.....	.....	.....
English (Beddoe)	....	.....	77.6	.....	.....	....	.....	.....	.....	.....
Scientists	84	72.5-84.5	77.89±0.19	2.61±0.14	3.35±0.17	....	.....	.....	.....	.....
Laboratory	247	.....	78.28	.....	.....	....	.....	.....	.....	.....
Engineers	347	.....	77.90	.....	.....	....	.....	.....	.....	.....
Tennessee	133	.....	77.46	.....	.....	....	.....	.....	.....	.....
Old Americans (Average)	727	69.7-90.0	77.95	3.12	4.00	....	.....	.....	.....	.....
English (Hrdlička)	20	.....	79.0	.....	.....	....	.....	.....	.....	.....
British	....	.....	.....	.....	.....	11	76.50–82	79.09±0.38	1.86±0.27	2.35±0
Old Americans	....	.....	.....	.....	.....	210	72.63–86.36	79.40	2.89	3.64

TABLE XIV. CEPHALIC INDEX [a]

Neolithic: Long Barrows	72.5-75.7
Round Barrows	76.7
Bronze Age: Beaker Folk	83.0-85.5
Iron Age	74.2
Saxon	75.9
14th-15th century	77.3-79.2
14th-15th century, Hythe	81.2
17th century (2 localities)	75.5-76.6
18th century Scotch soldiers	73.7
18th century Irish soldiers	75.4
18th century English soldiers	76.4
19th and 20th centuries (53 groups)	74.9-81.9
General Mean (approximate)	78.0

[a] Where only skulls were available, the cranial index was approximated to the cephalic. See Parsons (71).

TABLE XV. FACIAL INDEX

Group	MALES Number	Range	Mean	S. D.	V.	FEMALES Number	Range	Mean	S. D.	V.
Society	85	75- 95	85.73±0.33	4.48±0.23	5.23±0.27	68	71-96	84.65±0.41	5.00±0.29	5.90±0.3
Norfolk	64	79-103	89.13±0.44	5.17±0.31	5.80±0.35	49	78-97	86.31±0.48	5.01±0.34	5.81±0.4
Scientists	84	79-100	89.17±0.34	4.59±0.24	5.15±0.27	....	.....	.....	.....	.....
Convicts	2,348	.....	89.98 [a]	.....	.....	....	.....	.....	.....	.....
Laboratory	247	73- 98	86.08	.....	.....	....	.....	.....	.....	.....
Engineers	256	.....	88.7	.....	.....	....	.....	.....	.....	.....
Drafted	91	.....	88.4	.....	.....	....	.....	.....	.....	.....
Tennessee	132	.....	87.75	.....	.....	....	.....	.....	.....	.....
Old Americans (Average)	726	.....	87.6	.....	.....	....	.....	.....	.....	.....
English (Hrdlička)	20	.....	88.1	.....	.....	....	.....	.....	.....	.....
British	....	.....	.....	.....	.....	11	78.50-98.00	86.64±1.14	5.60±0.81	6.46±0.93
Old Americans	....	.....	.....	.....	.....	210	74.2 -99.3	85.30	.....	.....

[a] Index of the means.

TABLE XVI. CEPHALO-FACIAL INDEX

Group	MALES Number	Range	Mean	S. D.	V.	FEMALES Number	Range	Mean	S. D.	V.
a	14	.....	90.86 [a]	.....	.....	11	.....	89.19 [a]	.....	.....
.....	10	.....	91.86 [a]	.....	.....	....	.....	.....	.....	.....
t	85	86- 99	91.36±0.19	2.65±0.14	2.90±0.15	68	81-97	90.21±0.25	3.05±0.18	3.38±0.20
.....	64	85- 97	90.67±0.24	2.81±0.17	3.10±0.18	49	85-95	88.98±0.23	2.40±0.16	2.70±0.18
ts	84	86-100	90.64±0.20	2.67±0.14	2.95±0.15	....	.....	.....	.....	.....
.....	2,348	.....	91.05 [a]	.....	.....	....	.....	.....	.....	.....
ericans	....	.....	90.1 [a]	.....	.....	....	.....	87.70 [a]	.....	.....
apel	....	.....	91.62 [a]	.....	.....	....	.....	88.65 [a]	.....	.....
lds	....	.....	.....	.....	.....	....	.....	88.08 [a]	.....	.....
.....	....	.....	.....	.....	.....	11	81.50-92.00	88.27±0.63	3.09±0.44	3.50±0.50

dex of the means.

TABLE XVII. FRONTO-PARIETAL INDEX

Group	MALES Number	Range	Mean	S. D.	V.	FEMALES Number	Range	Mean	S. D.	V.
os	10	.....	67.32 [a]	.....	.....	....	.....	.....	.....	.....
ciety	85	56-72	64.56±0.22	3.02±0.16	4.68±0.24	67	59-72	65.85±0.23	2.78±0.16	4.22±0.25
rfolk	64	60-77	66.92±0.24	2.85±0.17	4.25±0.25	49	61-76	68.29±0.30	3.15±0.21	4.61±0.31
ientists	84	66-84	72.19±0.23	3.17±0.16	4.39±0.23	....	.....	.....	.....	.....
boratory	....	.....	65.54 [a]	.....	.....	....	.....	.....	.....	.....
hitechapel	135	.....	70.37 [b]	.....	.....	....	.....	69.89 [b]	.....	.....
orfields	46	.....	69.58 [b]	.....	.....	....	.....	69.89 [b]	.....	.....
itish	....	.....	.....	.....	.....	11	67-76	72.73±0.50	2.47±0.36	3.40±0.49
d Americans	....	.....	.....	.....	.....	....	.....	63.38 [a]	.....	.....

[a] Index of the means. In calculating the index for Hrdlička's Laboratory series, it was necessary to use the mean head breadth. the Laboratory and Virginia series, and the mean minimum frontal of the Laboratory series alone.
[b] Index of the means reconstructed from skull measurements.

TABLE XVIII. ZYGOMATICO-FRONTAL INDEX

Group	MALES Number	Range	Mean	S. D.	V.	FEMALES Number	Range	Mean	S. D.	V.
ros	10	.....	73.29 [a]	.....	.....	....	.....	.....	.....	.....
ociety	85	61-78	70.66±0.24	3.30±0.17	4.67±0.24	67	66-80	73.21±0.27	3.32±0.19	4.53±0.26
orfolk	64	65-85	73.91±0.27	3.22±0.19	4.36±0.26	49	70-85	76.84±0.34	3.54±0.24	4.61±0.31
cientists	84	73-86	79.68±0.23	3.06±0.16	3.84±0.20	....	.....	.....	.....	.....
aboratory	247	.....	76.41 [a]	.....	.....	....	.....	.....	.....	.....
hitechapel	....	.....	76.79	.....	.....	....	.....	78.83 [b]	.....	.....
ritish	....	.....	.....	.....	.....	11	77.50-88	82.50±0.58	2.84±0.41	3.44±0.49
ld Americans	....	.....	.....	.....	.....	....	.....	77.91 [a]	.....	.....
oorfields	....	.....	.....	.....	.....	....	.....	79.35 [b]	.....	.....

[a] Index of the means.
[b] Index of means, see Tables VI and VIII.

TABLE XIX. ZYGOMATICO-GONIAL INDEX

Group	MALES Number	Range	Mean	S. D.	V.	FEMALES Number	Range	Mean	S. D.	V.
te	14	69-81	74.3	.....	.....	11	.....	72.98	.....	.....
.....	10	.....	74.86 [a]	.....	.....	.....	.....	.....	.....	.....
y	85	64-82	74.01±0.31	4.19±0.22	5.66±0.29	68	64-85	73.90±0.39	4.81±0.28	6.51±0.38
lk	64	65-86	76.44±0.32	3.74±0.22	4.89±0.29	49	71-84	76.86±0.64	2.81±0.19	3.68±0.25
ists	84	68.5-90.0	77.08±0.30	4.09±0.21	5.31±0.28	.....	.....	.....	.....	.....
atory	247	.....	76.70 [a]	.....	.....	.....	.....	.....	.....	.....
n	.....	.....	.....	.....	.....	11	73.80-83.50	76.86±0.64	3.14±0.45	4.09±0.59
mericans	.....	.....	.....	.....	.....	.....	.....	75.75 [a]	.....	.....

ndex of the means.

TABLE XX. NASAL INDEX

Group	MALES Number	Range	Mean	S. D.	V.	FEMALES Number	Range	Mean	S. D.	V.
)	14	.....	70.28	.....	.....	....	.....	.....	.....	.....
ate	10	.....	80.30	.....	.....	11	.....	77.30	.....	.....
y	85	65-104	80.32±0.53	7.22±0.37	8.99±0.47	68	60-104	77.03±0.66	7.91±0.46	10.27±0.59
lk	64	53-84	68.06±0.52	6.14±0.37	9.03±0.54	49	54-82	66.63±0.56	5.77±0.39	8.66±0.59
ists	84	48-80	63.67±0.48	6.47±0.34	10.16±0.53	....	.....	.....	.....	.....
atory	247	53.2-90.9	67.45	.....	.....	210	50.8-78.7	65.98	.....	.....
eers	347	.....	64.40	.....	.....	....	.....	.....	.....	.....
ssee	16	.....	66.70	.....	.....	....	.....	.....	.....	.....
mericans (Average)	....	.....	65.6	.....	.....	....	.....	.....	.....	.....
-Scotch	20	.....	65.1	.....	.....	....	.....	.....	.....	.....
(Browne)	102	.....	64.3	.....	.....	....	.....	.....	.....	.....
sh (Beddoe)	21	.....	67.0	.....	.....	....	.....	.....	.....	.....
h (Beddoe)	10	.....	70.0	.....	.....	....	.....	.....	.....	.....
sh (Hrdlička)	10	.....	64.7	.....	.....	....	.....	.....	.....	.....
s (Hrdlička)	35	.....	67.3	.....	.....	....	.....	.....	.....	.....
sh	....	.....	.....	.....	.....	11	49-71	62.64±1.36	6.71±0.96	10.71±1.54

TABLE XXI. SUMMARY OF THE ANTHROPOMETRIC CHARACTERS OF THE NORFOLK ISLANDERS

	MALES			FEMALES		
Character	Mean	S. D.	V.	Mean	S. D.	V.
Stature	174.00± .54 cm	6.35± .38 cm	3.65± .22	161.72± .49 cm	5.04± .34 cm	3.11± .21
Span	179.44± .63 "	7.41± .45 "	4.13± .25	163.71± .57 "	5.87± .40 "	3.59± .25
Sitting height	91.93± .27 "	3.15± .19 "	3.43± .20	85.66± .34 "	3.41± .24 "	3.99± .28
Shoulder height	142.88± .49 "	5.80± .35 "	4.07± .24	132.65± .47 "	4.89± .33 "	3.69± .25
Trunk height	60.86± .25 "	2.95± .18 "	4.85± .29	56.90± .35 "	3.58± .25 "	6.29± .43
Arm length	78.66± .31 "	3.68± .22 "	4.68± .28	71.69± .30 "	3.16± .22 "	4.41± .30
Leg length	82.03± .37 "	4.44± .26 "	5.41± .32	75.75± .26 "	2.69± .19 "	3.55± .24
Shoulder width	40.14± .16 "	1.86± .11 "	4.64± .28	36.46± .16 "	1.69± .12 "	4.65± .32
Hip width	29.50± .15 "	1.76± .11 "	5.96± .36	30.61± .21 "	2.17± .15 "	7.10± .49
Chest breadth	28.98± .17 "	2.01± .12 "	6.92± .41	27.01± .20 "	2.01± .14 "	7.46± .52
Chest depth	22.17± .16 "	1.90± .11 "	8.55± .51	20.84± .28 "	2.60± .20 "	12.50± .95
Head length	195.59± .49mm	5.82± .35mm	2.98± .18	185.61± .52mm	5.39± .37mm	2.90± .20
Head width	155.47± .37 "	4.34± .26 "	2.79± .17	150.61± .47 "	4.84± .33 "	3.21± .22
Horizontal head circumference	565.17±1.14 "	13.36± .80 "	2.36± .14	555.22±1.47 "	15.22±1.04 "	2.74± .19
Head height	135.69±1.07 "	12.67± .76 "	9.34± .56	124.96±1.07 "	11.06± .75 "	8.85± .60
Face width	140.88± .44 "	5.25± .31 "	3.73± .22	133.98± .45 "	4.72± .32 "	3.52± .24
Face height	125.30± .47 "	5.54± .33 "	4.42± .26	115.51± .63 "	6.52± .44 "	5.64± .38
Minimum frontal	104.00± .37 "	4.38± .26 "	4.21± .25	102.82± .44 "	4.61± .31 "	4.48± .31
Bigonial	107.64± .39 "	4.66± .28 "	4.33± .26	102.22± .40 "	4.20± .29 "	4.11± .28
Nose height	55.38± .27 "	3.26± .19 "	5.88± .35	52.27± .35 "	3.67± .25 "	7.02± .48
Nose width	37.56± .24 "	2.79± .17 "	7.43± .44	34.76± .26 "	2.74± .19 "	7.88± .54
Indices						
Relative sitting height	52.81± .11 "	1.34± .08 "	2.54± .15	53.16± .12 "	1.23± .08 "	2.31± .16
Cephalic	79.54± .24 "	2.86± .17 "	3.60± .21	81.16± .25 "	2.61± .18 "	3.22± .22
Breadth-height	87.36± .70 "	8.29± .49 "	9.49± .57	82.96± .72 "	7.46± .51 "	8.99± .61
Facial	89.13± .44 "	5.17± .31 "	5.80± .35	86.31± .48 "	5.01± .34 "	5.81± .40
Cephalo-facial	90.67± .24 "	2.81± .17 "	3.10± .18	88.98± .23 "	2.40± .16 "	2.70± .18
Fronto-parietal	66.92± .24 "	2.85± .17 "	4.25± .25	68.29± .30 "	3.15± .21 "	4.61± .31
Zygomatico-frontal	73.91± .27 "	3.22± .19 "	4.36± .26	76.84± .34 "	3.54± .24 "	4.61± .31
Zygomatico-gonial	76.44± .32 "	3.74± .22 "	4.89± .29	76.37± .27 "	2.81± .19 "	3.68± .25
Nasal	68.06± .52 "	6.14± .37 "	9.03± .54	66.63± .56 "	5.77± .39 "	8.66± .59
Upper facial	57.89± .25 "	2.88± .18 "	4.98± .30	52.21± .38 "	3.21± .27 "	6.14± .51
Relative shoulder height	82.17± .09 "	1.05± .09 "	1.28± .08	82.11± .10 "	1.00± .07 "	1.22± .08
Relative trunk height	35.01± .13 "	1.49± .09 "	4.26± .25	35.19± .14 "	1.48± .10 "	4.20± .29
Relative arm length	45.22± .10 "	1.22± .07 "	2.70± .16	44.41± .14 "	1.48± .10 "	3.33± .23
Relative leg length	47.18± .11 "	1.32± .08 "	2.80± .17	46.84± .12 "	1.19± .08 "	2.54± .17
Arm-leg	95.99± .27 "	3.16± .19 "	3.29± .20	94.75± .32 "	3.33± .23 "	3.51± .24
Relative span	103.28± .18 "	2.10± .13 "	2.03± .12	101.25± .22 "	2.22± .15 "	2.19± .15

TABLE XXII. EYE COLOR OF ENGLISH (PERCENTAGES)

	Light			Intermediate			Brown		
	Light	Blue Medium	Dark	Greenish-blue and greenish	Grayish-blue-and grayish	Mixed	Light	Medium	Dark
Males:									
Old Americans	7.9	14.8	1.1	2.2	5.0	52.5	4.5	9.3	2.7
		23.8			59.7			16.5	
				83.5					
England, Wales and Scotland	....	.....	....	66.0[a]	.....	.....	....	34.0	
Military	....	.....	....	61.1[a]	.....	.....	....	38.8	
Females:									
Old Americans	2.9	15.2	1.9	1.4	2.7	55.9	2.2	13.8	4.0
		20.0			60.0			20.0	
				80.0[a]					
England, Wales and Scotland	....	53.3			15.2			31.5	
				68.5					

[a] Includes light and intermediate.

TABLE XXIII. EYE COLOR OF POLYNESIAN GROUPS

	Black		Dark Brown		Light Brown		Blue		Gray		Blue-Brown		Green-Brown	
	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent
Society Islanders:														
Males	0	.0	70	83	13	16	0	.0	0	0	1	1	0	0
Females	0	.0	57	84	11	16	0	.0	0	0	0	0	0	0
Marquesans:														
Males	2	1.2	76	91.6	0	.0	6	7.2	0	0	0	0	0	0
Females	0	.0	67	90.5	0	.0	7	9.5	0	0	0	0	0	0
Tongans:														
Males	4	3.4	111	94.1	3	2.5	0	.0	0	0	0	0	0	0
Females	15	15.5	79	81.4	2	2.1	1	1.0	0	0	0	0	0	0
Samoans:														
Males	2	2.9	67	97.1	0	.0	0	.0	0	0	0	0	0	0
Females	3	13.0	19	82.6	1	4.3	0	.0	0	0	0	0	0	0

TABLE XXIV. EYE COLOR OF NORFOLK ISLANDERS

		Males: Number	Males: Per Cent	Females: Number	Females: Per Cent
Blue		12	18.75	3	6.12
Mixed	Gray; Blue-brown; Gray-brown; Gray, Blue, Green (Brown rays, flecks or rings); Brown-gray outer rim	29	45.31	28	57.14
Brown	Light 14; Dark 9	23	35.94	4; 14 — 18	36.74
		64		49	

TABLE XXV. EPICANTHIC FOLD

Group	Males: Absent	Males: Trace	Males: Medium	Males: Marked	Females: Absent	Females: Trace	Females: Medium	Females: Marked
Norfolk	98.39	1.61	.0	.0	97.73	2.27	.0	.0
Society	17.86	45.24	29.76	7.14	8.95	35.82	34.33	20.9
Samoa	68.1	27.5	2.8	1.4	47.8	43.4	8.8	.0
Tonga	56.8	29.7	8.1	5.4	53.6	26.8	14.4	5.2
Marquesas	21.7	55.4	19.3	3.6	20.3	40.5	28.4	10.8

TABLE XXVI. SKIN COLOR OF INNER ARM

von Luschan color scale	Males: Society No.	Males: Norfolk No.	Females: Society No.	Females: Norfolk No.
White	....	....	....	....
2	....	1	....	2
3	....	7	....	3
7	....	24	....	27
8	....	4	....	....
9	....	20	....	11
10	12	4	27	....
11	7	2	2	....
12	3	1	....	....
14	....	1	....	....
15	1	....	6	....
16	5	....	10	....
17	8	....	7	....
18	35	....	9	....
19	8	....	2	....
22	2	....	2	....

TABLE XXVII. SKIN COLOR OF CHEEK

von Luschan color scale	Males: Society No.	Males: Norfolk No.	Females: Society No.	Females: Norfolk No.
Pinkish-White	....	....	....	1
7	....	....	....	1
8	....	....	....	1
9	....	....	....	4
10	7	6	15	10
11	6	5	1	6
12	5	7	....	10
13	....	6	1	9
14	....	10	....	5
15	2	10	4	1
16	16	14	25	1
17	18	3	6	....
18	21	2	9	....
19	8	....	5	....
21	....	1	....	....
22	1	....	....	....

TABLE XXVIII. HAIR COLOR: PERCENTAGES

Group	MALES Lights Proper	Light Brown	Medium Brown	Dark Brown	Black	Red	Red Brown	FEMALES Lights Proper	Light Brown	Medium Brown	Dark Brown	Black	Red	Red Brown
Old American	5.3	16.0	50.0	25.0	1.1	2.6	.....	14.0	.....	50.0	29.0	1.3	4.9	.....
British	16.7	.....	38.3	34.8	5.8	4.4	.....	13.1	.....	38.1	39.3	4.8	4.7	.....
English	23.0	.....	44.9	24.5	3.8	3.5	.....	.....	.....	.....	.....	.....	.....	.....
Norfolk	1.82	.....	9.09	10.91	72.73	1.82	3.63	4.26	2.13	12.76	17.02	57.45	.....	6.38
Society	.....	.....	.....	4.88	81.71	.....	13.41	.....	1.51	1.51	4.55	77.27	.....	15.15
Samoans	.....	.....	.....	4.3	91.4	.....	.....	.....	.....	.....	8.8	56.9	.....	.....
Tongans	.....	.....	.....	4.2	94.1	.....	.....	.....	.....	.....	4.1	87.6	.....	.....
Marquesans	.....	.....	.....	6.3	87.5 [a]	.....	3.8	.....	.....	.....	6.3	84.2[a]	.....	9.5

[a] The hair of many Marquesans shows a reddish-brown tint in certain lights.

TABLE XXIX. HAIR COLOR OF NORFOLK ISLANDERS COMPARED WITH THE MENDELIAN EXPECTATION

	RR[a] Number	RR[a] Per Cent	DR Number	DR Per Cent	DD Number	DD Per Cent
Mendelian expectation	1	6.25	6	37.50	9	56.25
Norfolk Islanders:						
Males	2	3.64	13	23.63	40	72.73
Females	3	6.39	17	36.16	27	57.45
Combined males and females	5	4.90	30	29.41	67	65.69

[a] The hair color is grouped as follows: RR, blonde, light brown and red; DR, medium brown, dark brown and red brown; DD, black.

TABLE XXX. PERCENTAGES OF HAIR FORM OF SAMOANS, TONGANS, MARQUESANS, AND SOCIETY ISLANDERS

	MALES Straight	Low Waves	Deep Waves	Curly	Frizzly	Woolly	FEMALES Straight	Low Waves	Deep Waves	Curly	Frizzly	Woolly
Samoans	55.1	27.5	10.1	5.8	1.4	0	47.8	39.1	8.8	0	4.3	0
Tongans	41.5	41.5	14.4	2.5	0	0	34.4	46.9	12.5	5.2	1.0	0
Marquesans	30.5	31.7	6.1	6.8	4.9	0	25.7	35.1	12.2	18.9	6.8	1.3
Society Islanders	44.7	27.06	20.0	7.06	1.18	0	44.12	22.06	19.12	8.82	5.88	0

TABLE XXXI. PERCENTAGES OF HAIR FORM OF SOCIETY ISLANDERS AND NORFOLK ISLANDERS

	MALES Straight	Low Waves	Deep Waves	Curly	Frizzly	FEMALES Straight	Low Waves	Deep Waves	Curly	Frizzly
Norfolk Islanders	48.43	23.44	6.25	10.94	10.94	44.90	30.61	10.20	4.08	10.21
Society Islanders	44.70	27.06	20.0	7.06	1.18	44.12	22.06	19.12	8.82	5.88

TABLE XXXII. HAIR GROWTH

	None	Slight	Medium	Heavy
Upper cheek:				
Norfolk	3.12	15.62	29.69	51.56
Society	60.76	25.32	13.92	0
Samoans	10.1	46.3	31.9	11.5
Tongans	2.1	15.8	33.7	48.4
Marquesans	5.1	62.0	20.3	12.6
Lower cheek:				
Norfolk	0	17.19	21.87	60.94
Society	54.49	20.25	20.25	0
Samoans	14.5	43.3	23.2	18.8
Tongans	4.2	37.2	18.1	40.4
Marquesans	49.4	29.6	16.0	5.0
Chin:				
Norfolk	0	12.50	25.00	62.50
Society	8.86	53.16	37.97	0
Samoans	0	23.2	27.5	49.2
Tongans	0	19.4	30.6	50.0
Marquesans	5.1	62.0	20.5	12.6
Moustache:				
Norfolk	0	12.70	26.98	60.32
Society	4.17	62.50	30.55	2.78
Chest:				
Norfolk	48.21	5.36	10.71	35.71
Society	64.38	21.92	13.70	0
Samoans	59.7	22.3	14.9	3.0
Tongans	23.4	28.7	25.5	22.3
Marquesans	65.8	21.0	6.6	6.6
Forearm:				
Norfolk	9.38	18.75	23.43	48.44
Society	36.84	42.10	19.74	1.32
Samoans	3.0	19.1	35.3	42.6
Tongans	0	10.5	43.2	46.3
Marquesans	48.2	28.4	14.8	8.6
Leg:				
Norfolk	4.69	18.75	29.69	46.87
Society	22.67	49.33	28.0	0
Samoans	0	7.2	42.0	50.7
Tongans	0	7.3	66.7	26.0
Marquesans	19.0	55.2	17.7	10.1

TABLE XXXIII. SLOPE OF THE FOREHEAD

	MALES			FEMALES		
Group	Vertical	Moderate	Low	Vertical	Moderate	Low
Old Americans	97.3	2.7	0	98.0	2.0	0
Norfolk	13.11	50.82	36.07	67.35	28.57	4.08
Society	13.42	68.29	18.29	20.0	75.38	4.62
Samoans	40.0	58.5	1.5	85.7	14.3	0
Tongans	60.3	38.8	.9	84.4	15.6	0
Marquesans	9.6	84.3	6.1	32.9	67.1	0

TABLE XXXIV. GLABELLA

	MALES						FEMALES				
Group	Smooth	Slight	Below Medium	Medium	Above Medium	Prominent	Smooth	Below Medium	Medium	Above Medium	Prominent
Old Americans	0	5.3	18.0	65.3	8.0	3.3	7.3	50.7	38.0	4.1	0
Norfolk	9.52	....	....	36.51	....	53.97	56.25	....	33.33	....	10.42
Society	4.88	....	....	39.02	....	56.10	45.45	....	51.52	....	3.03
Samoans	29.4	....	....	55.8	....	14.7	100.0	....	0	....	0
Tongans	49.1	....	....	42.8	....	8.0	83.5	....	15.5	....	1.0
Marquesans	14.8	....	....	54.3	....	30.9	78.1	....	19.2	....	2.7

TABLE XXXV. NASAL PROFILE

	MALES				FEMALES			
Group	Convex	Concavo-Convex	Straight	Concave	Convex	Concavo-Convex	Straight	Concave
Old Americans	42.0	27.3	22.0	8.7	31.3	35.3	24.7	8.6
Norfolk	67.19	....	28.12	4.69	41.67	....	43.75	14.58
Society	6.1	....	82.93	10.97	7.81	....	62.5	29.69

TABLE XXXVI. NASAL BRIDGE

Group	Males			Females		
	Low	Medium	High	Low	Medium	High
Norfolk	4.69	26.56	68.75	16.33	57.14	26.53
Society	19.51	75.61	4.88	50.0	50.0	0
Samoans	21.4	64.3	14.3	56.9	39.1	4.3
Tongans	21.7	70.4	7.8	30.5	67.4	2.1
Marquesans	15.5	78.5	6.0	54.8	42.5	2.7

TABLE XXXVII. AXIS OF NOSTRILS

Group	Males			Females		
	Antero-posterior	Oblique	Trans-verse	Antero-posterior	Oblique	Trans-verse
Norfolk	18.75	57.81	23.44	0	39.1	60.9
Society	0	22.35	77.65	5.3	69.5	25.3
Marquesans	4.8	50.6	44.6	1.4	37.0	51.6
Tongans	1.7	78.3	20.0	0	17.65	82.35
Samoans	2.9	57.3	39.7	38.30	55.32	6.38

TABLE XXXVIII. NASAL SEPTUM

	Males						Females					
	Wide	Medium	Narrow	Exposed	Level	Hidden	Wide	Medium	Narrow	Exposed	Level	Hidden
Norfolk	21.9	31.2	46.9	93.55	6.45	0	15.56	53.33	31.11	86.36	9.09	4.55
Society	68.83	24.68	6.49	54.22	22.89	22.89	68.75	23.44	7.81	55.22	26.87	17.91

TABLE XXXIX. PROGNATHISM

	Males				Females			
	None	Slight	Medium	Promi-nent	None	Slight	Medium	Promi-nent
Norfolk	93.1	6.9	0	0	97.73	2.27	0	0
Society	98.8	0	1.2	0	98.53	0	1.47	0
Samoans	56.7	23.8	17.8	1.4	69.6	13.0	17.4	0
Tongans	53.3	22.0	24.6	0	46.4	37.1	15.5	1.0
Marquesans	98.8	0	1.2	0	90.4	1.4	8.2	0

TABLE XL. CHIN

	Males				Females			
	Promi-nent	Above Medium	Medium	Reced-ing	Promi-nent	Above Medium	Medium	Reced-ing
Old Americans	.....	20.0	80.0	0	.....	96.7	3.3	.....
Norfolk	52.38	.....	42.86	4.76	47.73	.....	47.73	4.54
Society	22.22	.....	75.31	2.47	10.45	.....	89.55	0

TABLE XLI. LIPS

	Males				Females			
	Thin	Medium	Above Medium	Thick	Thin	Medium	Above Medium	Thick
Old Americans	0.7	90.7	8.6	0	0.7	92.7	6.6	0
Norfolk	17.46	61.9	.....	20.64	16.67	62.50	.....	20.83
Society	1.19	88.1	.....	10.71	0	92.65	.....	7.35
Samoans	0	92.8	.....	7.1	4.3	91.4	.....	4.3
Tongans	10.3	83.6	.....	6.0	10.3	87.6	.....	2.1
Marquesans	8.4	65.1	.....	26.5	10.8	64.9	.....	24.3

TABLE XLII. DIFFERENCES BETWEEN MEANS OF MEASUREMENTS OF NORFOLK AND SOCIETY ISLANDERS

MALES

	Norfolk	Society	Excess	3×Probable Error
Head length	195.59±.49 mm.	188.01±.48 mm.	—7.58±.69	2.07
Head width	155.47±.37 mm.	159.58±.36 mm.	+4.11±.52	1.56
Face height	**125.30±.47 mm.**	**124.78±.46 mm.**	**— .52±.66**	**1.98**[a]
Bizygomatic	140.88±.44 mm.	145.72±.38 mm.	+4.84±.58	1.74
Minimum frontal	**104.00±.37 mm.**	**102.93±.37 mm.**	**—1.07±.52**	**1.56**
Bigonial	**107.64±.39 mm.**	**107.76±.45 mm.**	**+ .12±.60**	**1.80**
Nose height	**55.38±.27 mm.**	54.21±.26 mm.	—1.17±.37	1.11
Nose breadth	**37.56±.24 mm.**	43.40±.20 mm.	+5.84±.31	.93
Stature	174.00±.54 cm.	171.35±.43 cm.	—2.65±.69	2.07
Span	**179.44±.63 cm.**	**180.10±.54 cm.**	**+ .66±.83**	**2.49**
Shoulder height	**142.88±.49 cm.**	**143.32±.41 cm.**	**+ .44±.64**	**1.92**
Sitting height	91.93±.27 cm.	89.40±.25 cm.	—2.53±.37	1.11
Trunk height	**60.86±.25 cm.**	**61.40±.24 cm.**	**+ .54±.35**	**1.05**
Leg length	**82.03±.37 cm.**	**81.95±.33 cm.**	**— .08±.50**	**1.50**
Arm length	78.66±.31 cm.	79.90±.27 cm.	—1.24±.41	1.23

[a] Black type indicates that the difference is not significant or is less than three times the probable error of the difference.

TABLE XLIII. DIFFERENCES BETWEEN MEANS OF INDICES—NORFOLK AND SOCIETY ISLANDERS

MALES

	Norfolk	Society	Excess	3×Probable Error
Cephalic	79.54±.24	84.96±.28	+ 5.42±.37	**1.11**
Fronto-parietal	66.92±.24	64.56±.22	— 2.36±.33	.99
Cephalo-facial	**90.67±.24**[a]	**91.36±.19**	**+ .69±.31**	**.93**
Zygomatico-frontal	73.91±.27	70.66±.24	— 3.25±.36	1.08
Zygomatico-gonial	76.44±.32	74.01±.31	— 2.43±.45	1.35
Facial	89.12±.44	85.73±.33	— 3.39±.55	1.65
Nasal	68.06±.52	80.32±.53	+12.26±.67	2.01
Relative shoulder height	82.17±.09	83.65±.07	+ 1.48±.11	.33
Relative arm length	45.22±.10	46.04±.12	+ .82±.16	.48
Relative trunk height	35.01±.13	35.86±.12	+ .85±.18	.54
Relative span	103.28±.18	105.17±.18	+ 1.89±.25	.75
Relative leg length	47.18±.11	47.82±.12	+ .64±.16	.48
Relative sitting height	52.81±.11	52.18±.12	— .63±.16	.48
Arm-leg index	95.99±.27	97.83±.33	+ 1.84±.43	1.29

[a] See footnote, Table XLII.

TABLE XLIV. DIFFERENCES BETWEEN MEANS OF MEASUREMENTS—NORFOLK ISLANDERS AND BRITISH SCIENTISTS

MALES

	Norfolk	English	Excess	3×Probable Error
Head length	195.59±.49 mm.	198.51±.45 mm.	+2.92±.67	2.01
Head width	**155.47±.37 mm.**[a]	**154.55±.35 mm.**	**— .92±.51**	**1.53**
Head circumference	56.52±.11 cm.	57.37±.13 cm.	+ .85±.17	.51
Face height	**125.30±.47 mm.**	**124.77±.49 mm.**	**— 5.3±.68**	**2.04**
Bizygomatic	**140.88±.44 mm.**	**140.02±.38 mm.**	**— .86±.58**	**1.74**
Minimum frontal	104.00±.37 mm.	111.58±.42 mm.	+7.58±.56	1.68
Bigonial	**107.64±.39 mm.**	**108.02±.47 mm.**	**+ .38±.61**	**1.83**
Nose height	**55.38±.27 mm.**	**56.30±.28 mm.**	**+ .92±.39**	**1.17**
Nose breadth	37.56±.24 mm.	35.71±.21 mm.	—1.85±.32	.96
Stature	**174.00±.54 cm.**	**173.98±.50 cm.**	**— .02±.74**	**2.22**
Span	**179.44±.63 cm.**	**178.98±.57 cm.**	**— .46±.85**	**2.55**

[a] See footnote, Table XLII.

TABLE XLV. DIFFERENCES BETWEEN THE MEANS OF INDICES—NORFOLK ISLANDERS AND BRITISH SCIENTISTS

MALES

	Norfolk	Scientists	Diff. P.E.	3×P.E.
Cephalic	79.54±.24	77.89±.19	—1.65±.29	.87
Fronto-parietal	**66.92±.24**	72.19±.23	+5.27±.33	.99
Cephalo-facial	**90.67±.24**[a]	**90.64±.20**	**— .03±.31**	**.93**
Zygomatico-frontal	73.91±.27	79.68±.23	+5.77±.35	1.05
Zygomatico-gonial	**76.44±.32**	**77.08±.30**	**+ .64±.44**	**1.32**
Facial	**89.12±.44**	**89.17±.34**	**+ .05±.56**	**1.68**
Nasal	68.06±.52	63.67±.48	—4.39±.71	2.13
Relative Span	103.28±.18	102.86±.18	**— .42±.25**	**.75**

[a] See footnote, Table XLII.

TABLE XLVI. MEAN VALUES OF ANTHROPOMETRIC CHARACTERS OF SOCIETY ISLANDERS AND ENGLISH

	Society Islanders	Scientists
Head length	s[a]	s
Head width	s	nd
Face height	nd[a]	nd
Face width	s	nd
Nose height	s	nd
Nose width	s	s
Minimum frontal	nd	s
Bigonial	nd	nd
Stature	s	nd
Span	nd	nd
Indices:		
Cephalic	s	s
Fronto-parietal	s	s
Cephalo-facial	nd	nd
Zygomatico-gonial	s	nd
Zygomatico-frontal	s	s
Facial	s	nd
Nasal	s	s
Relative span	s	nd

[a] "s" indicates significant difference; "nd" no significant difference.

TABLE XLVII. DIFFERENCES BETWEEN THE MEANS OF NORFOLK ISLANDERS AND CONVICTS

MALES

	Norfolk	Convicts	Diff. P. E.	3×P.E
Head length	195.59± .49 mm.	192.45±.09 mm.	—3.14± .50	1.50
Head breadth	155.47± .37 mm.	151.02±.08 mm.	—4.45± .38	1.14
Face height	125.30± .47 mm.	123.73±.11 mm.	—1.57± .48	1.44
Bizygomatic	140.88± .44 mm.	137.51±.08 mm.	—3.37± .45	1.35
Head height	135.69±1.07 mm.	132.29±.11 mm.	—3.40±1.08	3.24
Head circumference	565.17±1.13 mm.	559.72±.22 mm.	—5.45±1.15	3.45
Stature	174.00± .54 cm.	166.29±.10 cm.	—7.71± .55	1.65
Span	179.44± .63 cm.	170.05±.13 cm.	—9.39± .64	1.92

TABLE XLVIII. DIFFERENCES BETWEEN MEANS OF MEASUREMENTS OF NORFOLK ISLANDERS AND OLD AMERICANS

MALES

	Norfolk	Old Americans	Diff.	3×P. E. of Norfolk series
Head length	195.59± .49 mm.	197.6 mm.[a]	+2.01	1.47
		195.0 mm.[b]	— .59[d]	1.47
Head width	155.47± .37 mm.	154.5 mm.[a]	— .93	1.11
		151.0 mm.[b]	—4.47	1.11
Head height	135.69±1.07 mm.	139.5 mm.[a]	+3.81	3.21
		136.1 mm.[b]	+ .41	3.21
Face height	125.30± .47 mm.	121.5 mm.	—3.80	1.41
Bizygomatic	140.88± .44 mm.	138.7 mm.	—2.18	1.32
Minimum frontal	104.00± .37 mm.	105.9 mm.	+1.90	1.11
Bigonial	107.64± .39 mm.	106.3 mm.	—1.34	1.17
Nose height	55.38± .27 mm.	53.5 mm.	—1.88	.81
Nose breadth	37.56± .24 mm.	36.1 mm.	—1.46	.72
Stature	174.00± .54 cm.	174.32 cm.	+ .32	1.62
Sitting height	91.93± .27 cm.	91.8 cm.	— .13	.81
Leg length	82.03± .37 cm.	82.52 cm.[c]	+ .49	1.11
Span	179.44± .63 cm.	179.2 cm.	— .22	1.89
Chest breadth	28.98± .17 cm.	29.76 cm.	+ .78	.51
Chest depth	22.17± .16 cm.	21.70 cm.	— .47	.48
Hand length	20.30± .13 cm.	19.28 cm.	—1.02	.39

[a] Laboratory and Virginia series.
[b] Tennessee series.
[c] Compiled from the Laboratory series.
[d] See note Table XLII.

TABLE XLIX. DIFFERENCES BETWEEN MEANS OF INDICES OF NORFOLK ISLANDERS AND OLD AMERICANS

MALES				
	Norfolk	Old Americans	Difference	3×P.E.
Cephalic	79.54±.24	77.95	—1.59	.72
Fronto-parietal	66.92±.24	68.54[a]	+1.62	.72
Cephalo-facial	90.67±.24	90.12[b]	— .96	.72
Zygomatico-frontal	73.91±.27	76.41[c]	+2.50	.81
Zygomatico-gonial	76.44±.32	76.70[d]	+ .26	.96
Facial	89.12±.44	87.6 (all)	—1.52	1.32
		86.8 (lab)	—2.32	
Nasal	68.06±.52	65.6 (all)	—2.46	1.56
		67.45 (lab)	— .61	
		64.40 (Southern Engineers)	—3.66	
Length-height	69.44±.55	70.6[e]	+1.16	1.65
		69.8[f]	+ .36	
Breadth-height	87.36±.70	90.29[e]	+2.93	2.10
		90.13[f]	+2.77	
Relative span	103.28±.18	102.8[h]	— .48	.54
Relative leg	47.18±.11	47.3[g]	+ .12	.33
Relative sitting height	52.81±.11	52.6 (all)	— .21	.33

[a] Computed from the means; minimum frontal mean of the Laboratory series and head width of Laboratory and Virginia series.
[b] Computed from the means of total series.
[c,d] Computed from the means of Laboratory series.
[e] Computed from the means of Laboratory and Virginia series.
[f] Computed from the means of Tennessee series.
[g] Leg length computed from the means of the Laboratory series and this computed mean used with the mean for stature for the Laboratory series.
[h] Computed from the means of Laboratory series.

TABLE L. DIFFERENCES BETWEEN THE MEANS OF NORFOLK AND AMERICAN SOLDIERS (DAVENPORT)

MALES				
	Norfolk	American Soldiers	Diff. P.E.	3×P.E.
Stature	174.00±.54 cm.	172.08±.07 cm.	—1.92±.54	1.62
Span	179.44±.63 cm.	175.61±.08 cm.	—3.83±.64	1.92
Sitting height	91.93±.27 cm.	90.63±.04 cm.	—1.30±.27	.81
Hip width	29.50±.15 cm.	29.28±.03 cm.	— .22±.15	.45
Shoulder width	40.14±.16 cm.	41.69±.02 cm.	+ .55±.16	.48
Chest depth	22.17±.16 cm.	21.45 cm.[a]	— .72±.16[a]	.48
Chest breadth	28.98±.17 cm.	28.87±.02 cm.	— .11±.17	.51

[a] Neither the standard deviation nor the seriation is given. It is assumed that the probable error for this mean is not very different from that of the mean for chest breadth.

TABLE LI. DIFFERENCES BETWEEN MEANS OF MEASUREMENTS OF NORFOLK AND SOCIETY ISLANDERS

FEMALES				
	Norfolk	Society	Diff. P. E.	3×P.E.
Head length	185.61±.52 mm.	178.85±.52 mm.	—6.76±.74	2.22
Head width	150.61±.47 mm.	154.13±.45 mm.	+3.52±.65	1.95
Face height	115.51±.63 mm.	118.47±.54 mm.	+2.96±.83	2.49
Bizygomatic	133.98±.45 mm.	138.94±.41 mm.	+4.96±.61	1.83
Minimum frontal	102.82±.44 mm.[a]	101.43±.35 mm.	—1.39±.56	1.68
Bigonial	102.22±.40 mm.	102.60±.56 mm.	+0.38±.69	2.07
Nose height	52.27±.35 mm.	52.12±.32 mm.	—0.15±.47	1.41
Nose breadth	34.76±.26 mm.	39.97±.27 mm.	+5.21±.37	1.11
Stature	161.72±.49 cm.	161.12±.43 cm.	—0.60±.65	1.95
Span	163.71±.57 cm.	164.82±.52 cm.	+1.11±.77	2.31
Sitting height	85.66±.34 cm.	83.88±.40 cm.	—1.78±.52	1.56
Trunk height	56.90±.35 cm.	58.55±.29 cm.	+1.65±.45	1.35
Leg length	75.75±.26 cm.	76.59±.32 cm.	+ .84±.41	1.23
Arm length	71.69±.30 cm.	73.36±.28 cm.	+1.67±.41	1.23
Shoulder height	132.65±.47 cm.	135.22±.39 cm.	+2.57±.61	1.83

[a] See footnote, Table XLII.

TABLE LII. DIFFERENCES BETWEEN THE MEANS OF INDICES OF NORFOLK AND SOCIETY ISLANDERS

FEMALES	Norfolk	Society	Diff. P. E.	3×P. E.
Cephalic	81.16±.25	86.21±.31	+5.05±.40	1.20
Fronto-parietal	68.29±.30	65.85±.23	—2.44±.38	1.14
Cephalo-facial	88.98±.23	90.21±.25	+1.23±.34	1.02
Zygomatico-frontal	76.84±.34	73.21±.27	—3.63±.43	1.29
Zygomatico-gonial	76.37±.27	73.90±.39	—2.47±.47	1.41
Facial	86.31±.48	84.65±.41	—1.66±.63	1.89
Nasal	66.63±.56	77.03±.65	+10.40±.86	2.58
Relative shoulder height	82.11±.10	83.94±.09	+1.83±.13	.39
Relative arm length	44.41±.14	45.50±.13	+1.09±.19	.57
Relative trunk	35.19±.14	36.33±.17	+1.14±.22	.66
Relative span	101.25±.22	102.23±.22	+ .98±.31	.93
Relative leg length	46.84±.12	47.62±.13	+ .78±.18	.54
Relative sitting height	53.16±.12	52.46±.13	— .70±.18	.54
Leg-arm index	94.75±.32	95.50±.34	± .84±.47	1.41

TABLE LIII. DIFFERENCES BETWEEN MEANS OF MEASUREMENTS OF NORFOLK ISLANDERS AND BRITISH WOMEN

FEMALES	Norfolk	British	Diff. P.E.	3×P.E.
Head length	185.61±.52 mm.	188.55± .57 mm.	+2.94± .77	2.31
Head width	150.61±.47[a] mm.	149.00± .65 mm.	—1.61± .80	2.40
Head circumference	55.52±.15 cm.	55.32± .22 cm.	— .20± .27	.81
Face height	115.51±.63 mm.	113.82±1.20 mm.	—1.69±1.35	4.05
Bizygomatic	133.98±.45 mm.	131.45±1.07 mm.	—2.53±1.16	3.48
Minimum frontal	102.82±.44 mm.	108.36± .74 mm.	+5.54± .86	2.58
Bigonial	102.22±.40 mm.	101.09±1.06 mm.	—1.13±1.13	3.39
Nose height	52.27±.35 mm.	52.55± .81 mm.	+.28± .88	2.63
Nose breadth	34.76±.26 mm.	32.82± .63 mm.	—1.94±. 68	2.04
Stature	161.72±.49 cm.	165.27±1.16 cm.	+3.55±1.26	3.78
Span	163.71±.57 cm.	167.30±1.39 cm.	+3.59±1.50	4.50

[a] See footnote Table XLII.

TABLE LIV. DIFFERENCE BETWEEN THE MEANS OF INDICES, NORFOLK ISLANDERS AND BRITISH WOMEN

FEMALES	Norfolk	British	Diff. P. E.	3×P.E.
Cephalic index	81.16±.25	79.09± .38	—2.07± .45	1.35
Fronto-parietal	68.29±.30	72.73± .50	+4.44± .58	1.74
Cephalo-facial	88.98±.23	88.27± .63	—0.71± .67[a]	2.01
Zygomatico-frontal	76.84±.34	82.50± .58	+5.66± .67	2.01
Zygomatico-gonial	76.37±.27	76.86± .64	+0.49± .69	2.07
Facial index	86.31±.48	86.64±1.14	+0.33±1.24	3.72
Nasal index	66.63±.56	62.64±1.36	—3.99±1.47	4.41
Relative span	101.25±.22	101.05± .28	—0.20± .36	1.08

[a] See footnote Table XLII.

TABLE LV. DIFFERENCES BETWEEN MEANS OF MEASUREMENTS, NORFOLK ISLANDERS AND OLD AMERICANS

FEMALES	Norfolk	Old Americans	Difference	3 × P. E. of Norfolk Series
Head length	185.61± .52 mm.	186.2 mm.	+ .59	1.56
Head width	150.61± .47 mm.	148.0 mm.	—2.61	1.41
Head height	124.96±1.07 mm.	133.3 mm.	+8.34	3.21
Face height	115.51± .63 mm.	110.9 mm.	—4.61	1.89
Bizygomatic	133.98± .45 mm.	129.9 mm.	—4.08	1.35
Minimum frontal	102.82± .44 mm.	101.2 mm.	—1.62	1.32
Bigonial	102.22± .40 mm.	98.4 mm.	—3.82	1.20
Nose height	52.27± .35 mm.	49.4 mm.	—2.87	1.05
Nose breadth	34.76± .26 mm.	32.5 mm.	—2.26	0.78
Stature	161.72± .49 cm.[a]	161.85 cm.	+ .13	1.47
Sitting height	85.66± .34 cm.	87.27 cm.	+1.61	1.02
Leg length	75.75± .26 cm.	74.58 cm.	—1.17	0.78
Span	163.71± .57 cm.	161.2 cm.	—2.51	1.71
Chest breadth	27.01± .20 cm.	26.62 cm.	— .39	0.60
Chest depth	20.84± .28 cm.	20.03 cm.	— .81	0.84
Hand length	18.76± .17 cm.	17.34 cm.	1.42	0.51

[a] See footnote, Table XLII.

TABLE LVI. DIFFERENCES BETWEEN MEANS OF INDICES, NORFOLK ISLANDERS AND OLD AMERICANS

FEMALES				
	Norfolk	Old Americans	Difference	3 × P. E. of Norfolk Series
Cephalic	81.16± .25	79.40	—1.76	0.75
Length-height	67.35± .57	71.59[1]	+4.24	1.71
Breadth-height	82.96± .72	90.07[1]	+7.11	2.16
Fronto-parietal	68.29± .30[a]	68.38	+0.09	0.90
Cephalo-facial	88.98± .23	87.77	—1.21	0.69
Zygomatico-frontal	76.84± .34	77.9	+1.06	1.02
Zygomatico-gonial	76.37± .27	75.75	—0.62	0.81
Facial	86.31± .48	85.30	—1.01	1.44
Nasal	66.63± .56	65.98	—0.65	1.68
Relative span	101.25± .22	99.60[1]	—1.65	0.66
Relative leg	46.84± .12	46.08[k]	—0.76	0.36
Relative sitting height	53.16± .12	53.92	+0.76	0.36

[a] See footnote, Table XLII.

TABLE LVII. COMPARISON OF THE DIFFERENCE OF THE MEANS OF SOCIETY ISLANDERS AND BRITISH SCIENTISTS FROM NORFOLK HYBRIDS

MALES		
	Society	Scientists
Measurements:		
Head length	— 7.58 mm.	+2.92 mm.
Head width	+ 4.11 mm.	—0.92 mm.
Face height	— 0.52 mm.	—0.53 mm.
Face width	+ 4.84 mm.	—0.86 mm.
Nose height	— 1.17 mm.	+0.92 mm.
Nose width	+ 5.84 mm.	—1.85 mm.
Minimum frontal	— 1.07 mm.	+7.58 mm.
Bigonial	+ 0.12 mm.	+0.38 mm.
Stature	— 2.65 cm.	—0.02 cm.
Span	+ 0.66 cm.	—0.46 cm.
Indices:		
Cephalic	+ 5.42	—1.65
Fronto-parietal	— 2.36	+5.27
Cephalo-facial	+ 0.69	—0.03
Zygomatico-frontal	— 3.25	+5.77
Zygomatico-gonial	— 2.43	+0.64
Facial	— 3.39	+0.05
Nasal	+12.26	—4.39
Relative span	+ 1.89	—0.42
Mean difference regardless of signs:		
10 Measurements	5.84 mm.	2.08 mm.
8 Indices	3.96	2.28

TABLE LVIII. COMPARISON OF BACK-CROSS WITH NORFOLK ISLANDERS AND PURE TAHITIANS

	MALES			FEMALES		
Measurements:	Norfolk	F_1 × Pure Tahitians (Back-Cross)	Pure Tahitians	Norfolk	F_1 × Pure Tahitians (Back-Cross)	Pure Tahitians
Stature	174.0 cm.	173.0 cm.	171.35 cm.	161.72 cm.	159.50 cm.	161.12 cm.
Sitting height	91.93 cm.	89.7 cm.	89.40 cm.	85.66 cm.	83.88 cm.	83.88 cm.
Span	179.44 cm.	184.0 cm.	180.10 cm.	163.71 cm.	161.50 cm.	164.82 cm.
Head length	195.59 mm.	185.14 mm.	188.01 mm.	185.61 cm.	177.25 mm.	178.85 mm.
Head breadth	155.47 mm.	156.29 mm.	159.58 mm.	150.61 mm.	152.38 mm.	154.13 mm.
Minimum frontal	104.00 mm.	101.29 mm.	102.93 mm.	102.82 mm.	100.62 mm.	101.43 mm.
Bigonial	107.64 mm.	106.14 mm.	107.76 mm.	102.22 mm.	101.50 mm.	102.60 mm.
Face width	140.88 mm.	143.29 mm.	145.72 mm.	133.98 mm.	134.25 mm.	138.94 mm.
Face height	125.30 mm.	119.4 mm.	124.78 mm.	115.51 mm.	116.62 mm.	118.47 mm.
Nose height	55.38 mm.	51.29 mm.	54.21 mm.	52.27 mm.	50.75 mm.	52.12 mm.
Nose width	37.56 mm.	40.86 mm.	43.40 mm.	34.76 mm.	38.0 mm.	39.97 mm.
Indices:						
Relative sitting height	52.81	51.87	52.18	53.16	52.62	52.46
Cephalic index	79.54	84.42	84.96	81.16	86.04	86.21
Fronto-parietal index	66.92	64.85	64.56	68.29	66.05	65.85
Cephalo-facial	90.67	91.69	91.36	88.98	88.14	90.21
Zygomatico-frontal	73.91	70.70	70.66	76.84	75.08	73.21
Zygomatico-gonial	76.44	74.08	74.01	76.37	75.64	73.90
Facial index	89.12	83.50	85.73	86.31	87.05	84.65
Nasal index	68.06	79.57	80.32	66.63	75.11	77.03
Relative span	103.28	106.33	105.17	101.25	101.24	102.23

TABLE LIX. NON-MENSURABLE CHARACTERS OF OFFSPRING OF BACK-CROSS MATINGS BETWEEN F_1 (TAHITIAN AND ENGLISH) AND PURE TAHITIAN

Skin color, unexposed							
Number	1-10	10	12	16	17	18	19
Males	....	1	1	2	1	1	1
Females	1	5	....	....	1	1	....
Skin color, exposed							
Number	6	10	11	12	15	16	18
Males	....	....	....	1	1	3	2
Females	1	4	1	....	....	2	....

Hair color						
	Black	Reddish Brown				
Males	6	1				
Females	7	1				
Hair form						
	Straight	Low waves	Deep waves	Curly		
Males	4	....	2	1		
Females	5	1	....	2		
Hair texture						
	Medium	Fine				
Males	3	4				
Females	1	7				
Eye color						
	Dark Brown	Light Brown				
Males	4	2				
Females	3	4				
Epicanthic fold						
	Absent	Trace	Medium			
Males	5	....	2			
Females	6	2	....			
Nose bridge						
	Low	Medium	High			
Males	....	6	....			
Females	2	5	1			
Nasal profile						
	Convex	Straight				
Males	....	6				
Females	1	7				
Axis of nostrils						
	Antero-posterior	Oblique	Transverse			
Males	....	4	3			
Females	1	2	5			
Septum						
	Wide	Medium	Narrow	Exposed	Level	Hidden
Males	3	2	1	4	2	1
Females	4	3	....	4	3	1
Lips						
	Medium	Thick				
Males	6	1				
Females	8	....				
Chin						
	Prominent	Medium	Receding			
Males	1	5	....			
Females	1	6	1			
Slope of forehead						
	Vertical	Moderate	Marked			
Males	2	4	1			
Females	2	6	....			
Glabella						
	Smooth	Medium	Prominent			
Males	....	2	5			
Females	3	4	....			

TABLE LX. SEX DIFFERENCES: MEASUREMENTS

	Sex	Society	Norfolk	Scientists	Old Americans
Head length	M.	188.01	195.59	198.51	197.12
	F.	178.85	185.61	188.55	186.20
		+9.16	+9.98	+9.96	+10.92
Head width	M.	159.58	155.47	154.55	153.86
	F.	154.13	150.61	149.00	148.00
		+5.45	+4.86	+5.55	+5.86
Face width	M.	145.72	140.88	140.02	138.7
	F.	138.94	133.98	131.45	129.9
		+6.78	+6.90	+8.57	+8.80
Face height	M.	124.78	125.30	124.77	121.5
	F.	118.47	115.51	113.82	110.9
		+6.31	+9.79	+10.95	+10.6
Minimum frontal	M.	102.93	104.00	111.58	105.9
	F.	101.43	102.82	108.36	101.2
		+1.50	+1.18	+3.22	+4.7
Bigonial	M.	107.76	107.64	108.02	106.3
	F.	102.60	102.22	101.09	98.4
		+5.16	+5.42	+6.93	+7.9
Nose height	M.	54.21	55.38	56.30	53.5
	F.	52.12	52.27	52.55	49.4
		+2.09	+3.11	+3.75	+4.1
Nose width	M.	43.40	37.56	35.71	36.1
	F.	39.97	34.76	32.82	32.5
		+3.43	+2.80	+2.89	+3.6
Stature	M.	171.35	174.00	173.98	174.32
	F.	161.12	161.72	165.27	161.85
		+10.23	+12.28	+8.71	+12.47
Span	M.	180.10	179.44	178.98	179.2
	F.	164.82	163.71	167.30	161.2
		+15.28	+15.73	+11.68	+18.0

TABLE LXI. SEX DIFFERENCES: INDICES

	Sex	Society	Norfolk	Scientists	Old Americans
Cephalic	M.	84.96	79.54	77.89	77.95
	F.	86.21	81.16	79.09	79.40
		—1.25	—1.62	—1.20	—1.45
Fronto-parietal	M.	64.56	66.92	72.19	68.54
	F.	65.85	68.29	72.73	68.38
		—1.29	—1.37	—0.54	+0.16
Cephalo-facial	M.	91.36	90.67	90.64	90.12
	F.	90.21	88.98	88.27	87.77
		+1.15	+1.69	+2.37	+2.35
Zygomatico-frontal	M.	70.66	73.91	79.68	76.41
	F.	73.21	76.84	82.50	77.91
		—2.55	—2.93	—2.82	—1.50
Zygomatico-gonial	M.	74.01	76.44	77.08	76.70
	F.	73.90	76.37	76.86	75.75
		+0.11	+0.07	+0.22	+0.95
Facial	M.	85.73	89.12	89.17	87.6
	F.	84.65	86.31	86.64	85.3
		+1.08	+2.81	+2.53	+2.3
Nasal	M.	80.32	68.06	63.67	67.45
	F.	77.03	66.63	62.64	65.98
		+3.29	+1.43	+1.03	+1.47
Relative span	M.	105.17	103.28	102.86	102.8
	F.	102.23	101.25	101.05	99.6
		+2.94	+2.03	+1.81	+3.2
Relative sitting height	M.	52.18	52.81	.....	52.60
	F.	52.46	53.16	.....	53.92
		—0.28	—0.35	.....	—1.32

TABLE LXII. COMPARISON OF STANDARD DEVIATIONS

	MALES							FEMALES		
	Norfolk	Society	Scientists	American (Davenport)	English (Davenport)	Scotch (Davenport)	Convicts	Norfolk	Society	British
ements:										
ıre	6.35 cm.	5.91 cm.	6.83 cm.	6.88 cm.	6.62 cm.	6.39 cm.	.....	5.04 cm.	5.21 cm.	5.69 cm.
	7.41 cm.	7.36 cm.	7.68 cm.	7.95 cm.	7.95 cm.	7.92 cm.	.....	5.87 cm.	6.18 cm.	6.51 cm.
ıg height	3.15 cm.	3.43 cm.	.....	3.51 cm.	3.45 cm.	3.47 cm.	.....	3.41 cm.	4.86 cm.	.....
lder height	5.80 cm.	5.56 cm.	.....	.....	.....	.....	.....	4.89 cm.	4.80 cm.	.....
k height	2.95 cm.	3.24 cm.	.....	.....	.....	.....	.....	3.58 cm.	3.52 cm.	.....
length	3.68 cm.	3.66 cm.	.....	.....	.....	.....	.....	3.16 cm.	3.34 cm.	.....
ength	4.44 cm.	4.48 cm.	.....	.....	.....	.....	.....	2.69 cm.	3.83 cm.	.....
l length	5.82 mm.	6.54 mm.	6.16 mm.	.....	.....	.....	6.39 mm.	5.39 mm.	6.31 mm.	2.78 mm.
l width	4.34 mm.	4.96 mm.	4.73 mm.	.....	.....	.....	5.48 mm.	4.84 mm.	3.46 mm.	3.19 mm.
height	5.54 mm.	6.35 mm.	6.62 mm.	.....	.....	.....	7.70 mm.	3.52 mm.	6.66 mm.	5.91 mm.
width	5.25 mm.	5.13 mm.	5.12 mm.	.....	.....	.....	5.64 mm.	4.72 mm.	4.96 mm.	5.25 mm.
mum frontal	4.38 mm.	4.99 mm.	5.65 mm.	.....	.....	.....	.....	4.61 mm.	4.99 mm.	3.65 mm.
nial	4.66 mm.	6.11 mm.	6.45 mm.	.....	.....	.....	.....	4.20 mm.	6.83 mm.	5.20 mm.
e height	3.26 mm.	3.51 mm.	3.84 mm.	.....	.....	.....	.....	3.67 mm.	3.87 mm.	3.98 mm.
e width	2.79 mm.	2.77 mm.	2.86 mm.	.....	.....	.....	.....	2.74 mm.	3.31 mm.	3.10 mm.
s:										
ıalic	2.86	3.84	2.61	.....	.....	.....	3.00	2.61	3.82	1.86
nto-parietal	2.85	3.02	3.17	.....	.....	.....	.....	3.15	2.78	2.47
halo-facial	2.81	2.65	2.67	.....	.....	.....	.....	2.40	3.05	3.09
omatico-frontal	3.22	3.30	3.06	.....	.....	.....	.....	3.54	3.32	2.84
omatico-gonial	3.74	4.19	4.09	.....	.....	.....	.....	2.81	4.81	3.14
ial	5.17	4.48	4.59	.....	.....	.....	.....	5.01	5.00	5.60
al	6.14	7.22	6.47	.....	.....	.....	.....	5.77	7.91	6.71
ative span	2.10	2.51	2.38	.....	.....	.....	.....	2.22	2.61	1.31
ative sitting height	1.34	1.58	.....	.....	.....	.....	.....	1.23	1.59	.....

TABLE LXIII. COMPARISON OF COEFFICIENTS OF VARIATION

	MALES			FEMALES		
	Norfolk	Society	Scientists	Norfolk	Society	British
Stature	3.65	3.45	3.93	3.11	3.24	3.44
Span	4.13	4.09	4.29	3.59	3.75	3.89
Sitting height	3.43	3.84	.....	3.99	5.79	.....
Shoulder height	4.07	3.88	.....	3.69	3.55	.....
Trunk height	4.85	5.27	.....	6.29	6.01	.....
Arm length	4.68	4.58	.....	4.41	4.55	.....
Leg length	5.41	5.47	.....	3.55	5.00	.....
Head length	2.98	3.48	3.10	2.90	3.48	1.47
Head width	2.79	3.11	3.06	3.21	3.54	2.14
Face height	4.42	5.09	5.31	5.64	5.62	5.19
Face width	3.73	3.52	3.65	3.52	3.57	3.99
Minimum frontal	4.21	4.85	5.06	4.48	4.26	3.37
Bigonial	4.33	5.67	5.97	4.11	6.66	5.14
Nose height	5.88	6.47	6.82	7.02	7.43	7.57
Nose width	7.43	6.38	8.01	7.88	8.28	9.45
Cephalic	3.60	4.52	3.35	3.22	4.43	2.35
Fronto-parietal	4.25	4.68	4.39	4.01	4.22	3.40
Cephalo-facial	3.10	2.90	2.95	2.70	3.38	3.50
Zygomatico-frontal	4.36	4.67	3.84	4.61	4.53	3.44
Zygomatico-gonial	4.89	5.66	5.31	3.68	6.51	4.09
Facial	5.80	5.23	5.15	5.81	5.90	6.46
Nasal	9.03	8.99	10.16	8.66	10.27	10.71
Relative span	2.03	2.39	2.31	2.19	2.55	1.30
Relative sitting height	2.54	3.03	.....	2.31	3.03	.....

TABLE LXIV. COMPARATIVE ANTHROPOMETRIC ANALYSES

Character	Sex	English	Approach to English	Mid-position	Approach to Tahitian	Tahitian	Superior to Parent groups	No difference between hybrids and parent stocks
Stature	M						X	
	F							X
Sitting height	M	X						
	F			X				
Head length	M	X						
	F		X					
Head width	M			X				
	F			X				
Horizontal head circumference	M							X
	F							
Face width	M		X					
	F			X				
Face height	M							X
	F			X				
Minimum frontal	M				X			
	F							X
Bigonial	M							X
	F							X
Nose height	M			X				
	F							X
Nose width	M		X					
	F		X					
Relative sitting height	M	X						
	F			X				
Cephalic index	M		X					
	F		X					
Facial index	M	X						
	F	X						
Cephalo-facial index	M							X
	F		X					
Fronto-parietal index	M				X			
	F			X				
Zygomatico-frontal index	M			X				
	F			X				
Zygomatico-gonial index	M	X						
	F	X						
Nasal index	M		X					
	F		X					
Summary	M	5	4	3	2	0	1	4
	F	2	5	7	0	0	0	4

INDIVIDUAL RECORDS

The individual records of the Norfolk Islanders are contained in the following tables. Of these numbers, 102-104 inclusive represent British women who have married Norfolk Islanders.

KEY TO TABLES

A Catalog number
1 Stature
2 Span
3 Porion height
4 Acromion height
5 Sitting height
6 Height of radiale
7 Height of stylion
8 Height of dactylion
9 Height of tibiale
10 Height of spherion
11 Acromial width
12 Hip width
13 Chest depth
14 Chest width
15 Head length
16 Head width
17 Minimum frontal diameter
18 Face width
19 Bigonial diameter
20 Face height
21 Nose height
22 Nose width
23 Upper face height
24 Horizontal head circumference

B Age
a Skin color—inner side of upper arm; von Luscan's scale.
b Skin color—cheek; von Luschan's scale.
c Hair form: st, straight; lw, low waves; dw, deep waves; c, curly; fr, frizzly.
d Hair texture: c, coarse; m, medium; f, fine.
e Hair color: bl, black; dbr, dark brown; br, brown; lbr, light brown; rbr, red brown; r, red; bln, blond.
f Eye color: dbr, dark brown; lbr, light brown; g-b, gray or green brown; bl-br, blue-brown; g, gray or green; bl, blue.
g Eye fold: abs, absent; tr, trace; m, medium.
h Nasal bridge: l, low; m, medium; h, high.
i Nasal profile: st, straight, cv, convex; cc, concave; c-c, concave-convex.
j Axis of nostrils: a-p, antero-posterior; obl, oblique; tr, transverse.
k Forehead: v, vertical; m, medium; l, low.
l Glabella: sm, smooth; m, medium; p, pronounced.
m Lips: th, thick; m, medium; tn, thin.
n Prognathism: n, none; m, medium; p, pronounced.
o Chin: p, pronounced; m, medium; r, receding.
p Bite: u, under; e-e, edge to edge; slo, slight overbite; mo, marked overbite.

TABLE LXV. ANTHROPOMETRIC CHARACTERS: INDIVIDUAL RECORDS OF NORFOLK ISLAND MALES

NUMBERS 65-80 ARE BOYS

A	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	2
1	1845	1919	1703	1522	972	1154	876	693	485	85	420	309	215	320	221	146	103	132	108	136	53	38	8
2	1854	1953	1712	1526	960	1152	900	669	489	71	412	305	290	325	189	151	103	136	105	125	52	34	6
3	1611	1703	1495	1295	870	976	735	550	471	78	350	264	195	300	190	152	93	130	112	128	53	36	7
4	1713	1813	1578	1385	891	1056	806	592	416	76	405	288	212	280	194	156	108	141	112	125	52	39	7
5	1645	1703	1519	1328	863	1005	756	549	379	69	386	265	205	284	190	149	103	132	99	132	55	39	7
6	1815	1849	1682	1492	963	1142	871	670	471	76	424	290	219	290	196	152	102	138	107	129	57	37	....
7	1785	1843	1657	1457	972	1114	863	650	427	82	400	307	200	268	193	155	104	140	100	126	52	35	72
8	1762	1808	1628	1458	910	1119	848	658	458	92	380	280	217	260	201	155	99	134	103	127	55	38	70
9	1762	1774	1614	1422	948	1101	842	636	456	86	415	280	220	280	189	155	110	139	110	139	57	37	75
10	1691	1739	1560	1403	896	1062	816	618	424	87	388	283	221	285	189	151	100	140	108	124	56	35	73
11	1722	1820	1596	1404	889	1064	820	613	431	77	409	273	196	268	190	155	104	132	108	130	53	35	75
12	1752	1798	1613	1440	944	1078	859	644	432	86	398	270	208	261	193	150	101	136	104	128	55	37	76
13	1644	1707	1518	1367	860	1055	812	602	413	77	385	267	205	250	183	157	105	133	107	122	54	34	70
14	1723	1794	1595	1404	905	1056	826	613	434	85	400	288	202	266	198	142	97	136	101	125	52	38	72
15	1748	1794	1621	1436	922	1113	868	675	435	68	383	252	205	253	192	160	100	139	100	125	52	32	72
16	1807	1876	1659	1485	920	1123	858	667	446	68	389	296	207	294	199	153	118	139	112	123	55	41	71
17	1751	1807	1616	1443	935	1085	849	651	417	62	425	310	255	323	193	151	103	140	109	126	54	36	75
18	1700	1797	1552	1393	890	1053	800	595	415	69	372	262	215	257	193	147	98	131	107	126	58	35	76
19	1805	1880	1663	1522	931	1141	867	660	499	79	423	282	215	299	197	158	106	139	109	126	56	39	70
20	1844	1915	1687	1510	942	1136	874	660	502	76	405	297	220	279	190	156	106	150	108	125	57	32	80
21	1839	1835	1692	1513	1009	1182	936	711	455	92	412	300	222	286	200	159	109	145	109	125	56	38	....
22	1792	1855	1649	1455	947	1120	884	673	466	76	423	305	229	324	203	159	108	142	117	117	55	40	68
23	1659	1655	1526	1352	901	1058	852	639	411	63	366	275	203	269	192	152	106	140	104	119	53	32	65
24	1761	1827	1614	1433	931	1073	832	629	488	72	408	320	239	295	201	156	104	146	120	135	61	39	83
25	1700	1815	1565	1414	874	1067	810	607	468	75	396	293	202	280	199	161	103	141	113	125	49	41	70
26	1738	1807	1622	1433	945	1099	853	645	450	83	405	297	240	315	204	158	112	146	111	131	61	37	78
27	1669	1685	1569	1398	913	1076	836	668	470	65	369	265	220	270	191	160	101	142	101	135	58	31	79
28	1722	1795	1592	1390	885	1076	830	626	430	72	402	280	200	295	193	155	103	138	106	122	47	38	74
29	1817	1870	1664	1512	961	1158	897	686	466	79	403	335	225	308	204	161	102	147	109	127	57	41	72
30	1845	1838	1715	1537	971	1194	937	732	465	84	412	326	257	302	197	155	102	139	105	122	57	37	72
31	1710	1800	1580	1391	944	1052	819	629	429	82	420	290	226	305	193	161	109	148	109	129	53	34	70
32	1776	1888	1627	1474	923	1116	856	653	455	75	413	285	204	302	192	152	103	140	106	120	52	35	68
33	1733	1816	1586	1405	935	1060	827	609	433	78	393	302	205	289	191	156	101	140	103	130	60	37	72
34	1657	1684	1523	1356	900	1030	800	616	450	71	363	280	226	265	199	157	109	135	109	121	51	36	61
35	1730	1864	1620	1425	878	1078	838	630	472	83	409	288	212	300	195	157	104	139	106	115	56	43	73
36	1803	1850	1664	1488	944	1116	857	667	473	68	400	290	210	280	193	152	101	137	103	124	54	38	68
37	1702	1755	1561	1389	919	1061	830	630	426	72	410	287	213	280	196	159	98	142	101	129	53	36	69
38	1709	1706	1575	1412	910	1091	860	670	400	77	405	310	217	305	200	159	105	143	111	113	54	36	66
39	1764	1841	1633	1461	928	1134	873	674	440	64	406	297	232	290	194	159	111	143	110	130	58	36	75
40	1779	1864	1627	1466	917	1110	855	674	420	72	412	300	220	286	190	159	96	138	99	125	59	37	76
41	1720	1768	1592	1402	930	1081	843	635	425	74	404	291	210	280	198	159	105	144	104	131	59	40	80
42	1800	1843	1665	1519	940	1152	910	717	452	69	404	302	208	287	200	155	104	139	111	120	53	37	70
43	1722	1780	1581	1405	878	1118	830	629	425	82	404	305	201	285	191	154	105	138	106	116	57	39	74
44	1810	1858	1668	1499	950	1124	866	646	445	75	414	310	239	280	198	155	100	137	105	119	54	39	68
45	1668	1714	1531	1362	835	1030	815	605	434	74	379	283	210	255	184	155	104	139	110	125	57	35	79
46	1792	1847	1649	1499	927	1149	892	685	460	81	403	304	236	280	202	159	107	145	109	120	50	38	67
47	1728	1804	1599	1418	934	1078	835	636	414	91	407	294	238	320	192	149	105	141	110	123	57	35	68
48	1813	1922	1649	1463	960	1103	839	608	460	77	450	325	237	310	203	163	106	147	106	120	59	38	74
49	1696	1759	1559	1388	903	1071	817	630	422	82	402	295	240	292	197	158	105	142	106	125	56	39	73
50	1859	1859	1692	1525	927	1169	905	685	485	82	408	.....	215	295	195	155	98	143	113	125	56	39	80
51	1749	1755	1626	1435	918	1097	874	685	467	95	409	305	235	310	195	155	97	150	98	135	59	37	77
52	1780	1821	1645	1465	920	1119	893	706	449	79	407	305	212	308	204	168	109	155	110	123	59	40	69
53	1657	1717	1528	1347	898	1022	788	616	402	63	410	287	218	292	190	157	101	144	117	125	60	33	73
54	1705	1775	1576	1420	891	1082	843	635	420	70	393	300	222	285	191	152	97	132	106	112	52	37	69
55	1676	1642	1535	1347	940	1041	820	633	406	69	395	290	240	285	202	157	110	144	110	131	58	40	77
56	1740	.....	1619	1442	924	1114	855	653	432	76	449	340	278	353	200	160	110	146	114	122	58	40	72
57	1806	.....	1652	1450	940	1146	927	661	420	79	405	320	230	295	196	158	110	149	114	120	54	41	67
58	1749	1836	1594	1423	914	1056	834	617	456	90	435	295	235	295	197	154	108	143	112	124	59	45	71
59	1713	1718	1596	1458	894	1056	815	630	477	80	398	313	260	310	205	150	103	138	111	136	62	41	75
60	1706	1683	1565	1406	904	1085	869	669	437	75	385	303	235	277	196	161	102	142	104	128	53	40	77
61	1604	1648	1493	1312	897	975	774	565	420	70	378	310	218	285	186	155	105	150	113	118	51	38	62
62	1722	1820	1576	1407	899	1064	820	606	443	72	408	316	216	326	199	157	103	145	105	129	63	41	75
63	1591	1638	1462	1304	878	993	776	600	383	83	370	290	191	275	190	151	107	146	101	122	55	41	68
64	1672	1708	1555	1381	919	1055	847	641	433	89	375	300	240	282	195	155	105	149	113	129	51	42	....
65	.....	.....	.....	.....	.....	.....	.....	.....	.....	....	.....	.....	.....	.....	162	134	.....	.....	.....	.....	....	....	....
66	955	966	840	747	543	573	458	300	242	44	220	170	135	166	179	136	.....	121	.....	95	....	....	....
67	1226	1238	1103	945	649	722	561	433	319	60	280	200	140	187	188	143	98	120	95	102	43	30	63
68	1317	1318	1203	1046	697	822	654	476	345	59	287	201	150	202	180	147	103	120	91	107	49	32	64
69	1503	1525	1379	1273	768	950	748	565	402	64	330	235	190	240	190	155	103	129	100	120	50	30	74
70	1504	1536	1371	1228	785	930	739	551	418	78	335	230	165	209	194	157	106	133	102	121	46	32	69
71	1391	1384	1252	1128	745	874	677	515	344	63	298	235	158	213	193	152	104	130	94	113	44	29	67
72	1561	1619	1449	1291	779	984	748	572	423	79	310	245	180	225	190	148	104	126	97	109	48	34	68
73	1581	1630	1459	1270	844	990	742	561	424	75	338	240	180	222	192	150	100	129	103	119	51	38	72
74	1612	1673	1481	1307	864	996	765	570	413	77	322	257	174	225	183	150	107	130	95	126	51	33	71
75	1780	1907	1630	1459	894	1079	820	610	462	72	383	260	203	254	190	151	108	129	99	122	51	34	72
76	1597	1672	1465	1307	827	1012	785	582	423	75	352	240	175	271	190	149	100	135	107	122	51	33	71
77	1733	1790	1580	1410	894	1066	812	599	435	82	391	264	201	265	198	164	105	141	106	129	55	40	80
78	1688	1752	1556	1371	905	1051	802	625	406	67	365	265	196	235	188	153	101	136	104	124	52	35	72
79	1622	1752	1504	1322	839	993	764	559	472	79	357	277	185	283	188	148	99	136	107	116	55	34	71
80	1644	1703	1508	1334	902	1004	792	589	399	68	362	295	200	268	200	150	97	134	103	130	53	40	77

TABLE LXVI. ANTHROPOMETRIC CHARACTERS: INDIVIDUAL RECORDS OF NORFOLK ISLAND FEMALES

NUMBERS 81-99 ARE GIRLS

	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
17	1530	1399	1217	801	920	711	547	395	64	337	257	180	232	177	141	97	128	98	107	44	34	65	523
30	1732	1491	1328	871	1008	780	606	423	61	371	290	.....	.....	193	146	104	126	100	125	54	32	72	558
58	1619	1448	1277	820	958	753	563	423	57	357	260	170	260	179	153	106	135	102	113	50	32	71	530
75	1666	1452	1279	850	968	766	573	425	81	364	270	175	225	181	143	99	129	101	115	56	36	65	535
57	1608	1445	1265	832	978	752	554	422	72	342	274	166	237	180	142	100	126	98	107	50	35	66	525
12	1475	1392	1239	798	935	739	583	399	58	328	238	154	211	178	147	95	123	93	113	46	30	64	525
0	1665	1433	1285	802	960	750	568	430	56	342	261	160	210	185	153	107	126	91	109	47	34	62	550
40	1379	1284	1112	761	878	681	515	357	63	292	216	141	181	181	140	98	117	89	121	45	31	66	507
26	1472	1307	1140	744	872	666	489	390	63	310	220	150	205	186	140	100	117	91	107	47	29	66	532
6	1195	1088	966	665	758	591	448	323	47	260	191	145	175	176	139	94	114	88	104	41	31	58	505
9	1190	1106	945	666	739	570	440	300	53	262	195	142	180	173	142	90	113	87	100	41	28	59	503
77	1273	1176	992	685	760	593	435	321	66	275	220	136	185	175	142	96	124	92	98	39	31	57	510
87	1145	1073	933	660	741	586	446	293	60	246	181	122	170	175	140	96	112	85	96	46	27	60	510
05	1309	1186	1033	711	783	612	442	353	62	282	190	152	182	174	138	98	113	92	106	43	30	63	505
94	1207	1065	962	679	747	592	452	317	64	256	210	157	180	180	143	97	117	94	95	38	32	....	530
15	930	886	778	576	597	472	360	250	39	223	179	125	159	174	144	98	117	82	95	36	23	58	518
09	950	895	781	542	602	473	343	295	39	223	170	165	120	170	140	95	113	85	91	36	25	....	507
80	1225	880	744	554	568	440	322	240	44	218	174	130	169	174	140	99	120	78	90	....	....	....	.....
99	.....	.....	.....	.....	.....	.....	.....	.....	....	.....	.....	.....	.....	160	124	.....	.....	.....	.....	....	....	....	.....
37	.....	.....	.....	.....	.....	.....	.....	.....	....	.....	.....	.....	.....	192	156	100	138	98	.....	57	34	....	.....
44	.....	1396	.....	.....	.....	.....	.....	.....	....	.....	.....	.....	.....	188	154	100	138	101	.....	57	37	....	.....
48	1574	1438	1274	824	950	756	560	405	62	338	280	185	243	187	150	104	129	94	118	51	32	68	560
45	1625	1536	1330	885	1035	819	649	411	72	352	270	166	249	186	142	101	125	97	116	52	36	69	549
60	1621	1519	1362	879	1054	820	618	456	84	345	315	.....	.....	182	147	100	134	104	117	50	34	67	550
72	1723	1560	1386	884	1054	799	605	416	76	369	302	200	254	189	186	103	138	109	107	45	37	59	565
79	1750	1560	1377	889	1041	814	617	435	83	363	300	197	241	190	156	113	137	103	117	52	36	69	564
75	1572	1442	1275	809	980	778	590	446	70	350	290	195	241	185	152	100	134	99	119	54	34	70	562
09	1606	1494	1337	847	1040	800	615	414	72	365	325	240	264	192	158	107	136	101	126	48	32	76	577
71	1611	1440	1264	831	980	764	592	392	62	360	302	.....	252	181	150	99	135	101	125	51	31	78	545
04	1610	1465	1295	861	979	727	573	385	70	345	290	200	290	184	149	107	135	96	113	52	33	69	558
40	1746	1597	1447	933	1105	855	647	439	81	398	304	198	283	196	150	105	137	107	133	58	40	....	580
15	1625	1503	1319	830	1009	733	600	399	68	368	285	195	250	185	149	97	134	104	112	49	33	68	550
87	1594	1460	1307	855	997	786	597	420	77	359	290	190	245	179	147	97	131	105	110	53	32	71	540
30	1639	1499	1339	874	1046	820	639	415	72	376	320	210	276	182	142	104	129	99	114	49	30	69	535
17	1680	1501	1330	850	994	776	597	400	62	385	300	207	237	178	148	101	132	102	114	52	37	61	530
40	1615	1509	1343	914	1047	833	641	400	62	360	310	.....	278	184	146	105	128	102	112	52	33	67	540
31	1636	1501	1350	880	1076	823	650	435	69	387	335	248	295	184	147	107	137	106	108	52	35	....	555
86	1587	1466	1297	831	975	788	601	424	75	362	271	168	252	189	146	110	130	95	117	56	36	....	554
20	1606	1493	1359	846	1055	823	647	444	83	376	305	227	279	187	155	98	136	99	118	58	35	67	565
50	1653	1524	1343	835	1025	827	630	427	67	359	292	170	265	184	146	107	129	108	110	45	30	....	545
69	1591	1451	1271	858	970	762	574	427	75	347	286	189	246	184	149	101	126	94	117	54	32	73	546
43	1706	1611	1469	939	1103	863	668	445	80	383	333	220	280	192	150	106	135	105	131	57	36	73	572
06	1656	1490	1344	835	1054	834	606	406	62	367	302	.....	292	185	152	100	130	104	124	50	35	74	549
40	1565	1421	1246	831	926	706	547	371	71	351	295	170	255	184	152	101	130	101	112	58	36	70	530
31	1734	1585	1430	925	1100	867	664	407	79	405	320	220	292	199	165	110	148	106	120	51	37	....	600
21	1655	1485	1316	880	1021	798	610	396	80	368	280	200	260	186	146	102	130	101	122	48	29	73	553
15	1645	1494	1315	859	1009	806	625	424	79	359	278	197	263	189	151	100	133	105	122	51	38	68	562
05	1698	1487	1308	859	1006	751	560	415	85	342	272	190	232	184	143	109	132	102	114	45	32	64	548
80	1613	1453	1278	829	957	758	562	400	75	365	285	210	257	190	145	99	125	99	100	51	34	65	553
10	1607	1483	1333	868	1054	825	640	415	83	375	318	200	265	195	155	108	135	97	125	61	35	70	573
30	1650	1504	1334	894	1031	800	632	401	65	380	315	202	280	190	151	102	136	103	120	53	38	70	562
63	1598	1457	1301	820	977	755	586	414	73	348	305	.....	.....	180	144	96	126	102	112	53	30	69	544
23	1633	1495	1342	901	1027	804	633	373	74	365	295	220	285	189	148	104	138	101	116	51	34	69	555
70	1666	1534	1370	890	1071	850	656	410	70	385	365	.....	285	193	161	109	141	104	115	51	39	....	573
34	1601	1409	1278	805	985	794	601	401	83	334	325	235	285	185	149	99	140	109	111	57	35	69	553
52	1473	1407	1240	847	945	751	582	388	60	329	319	.....	250	179	150	96	128	93	106	50	34	69	545
13	1633	1477	1321	862	1025	793	604	428	69	360	272	195	260	180	152	102	131	101	109	47	33	....	540
27	1550	1421	1252	798	949	757	569	430	71	365	330	225	295	183	153	97	136	101	107	51	36	73	560
05	1612	1475	1307	859	1000	794	617	383	75	340	324	210	270	185	155	102	137	103	113	47	35	....	570
95	1785	1571	1394	891	1072	828	621	440	83	405	344	238	288	183	154	104	143	114	118	59	38	....	568
79	1618	1479	1289	839	992	775	537	393	68	353	305	215	284	174	145	96	138	108	112	52	35	69	518
21	1757	1596	1421	970	1109	870	674	447	82	392	340	.....	285	190	151	104	133	105	106	54	38	....	562
07	1585	1489	1313	850	1032	826	632	399	68	365	320	230	279	185	153	109	140	104	120	52	32	....	560
31	1632	1490	1318	862	1019	812	621	403	71	350	335	202	280	193	156	109	138	100	118	57	31	73	575
04	1610	1484	1342	853	1046	870	644	439	91	363	305	.....	300	183	149	108	136	104	119	54	34	....	556
90	1712	1481	1324	805	1012	775	593	427	77	375	305	250	280	184	154	98	133	106	108	51	37	....	558
70	1602	1445	1281	807	956	735	537	412	73	364	.....	285	323	193	155	95	134	102	117	55	38	....	570
02	1667	1465	1317	817	998	770	584	417	87	359	290	170	260	185	149	100	132	98	107	50	40	....	547
47	.....	1433	1296	.....	999	790	610	.....	....	.....	.....	.....	.....	177	160	110	140	105	114	56	39	....	560
85	1652	1445	1301	820	1000	785	594	383	71	362	340	260	301	173	147	97	135	101	119	56	37	70	520

TABLE LXVII. ANTHROPOMETRIC CHARACTERS: INDIVIDUAL RECORDS OF BRITISH FEMALES

1550	1538	1430	1239	830	943	735	562	395	78	325	283	210	249	182	142	97	129	96	107	51	29	....	52
1551	1542	1423	1267	815	980	775	600	390	77	352	.....	.....	262	186	148	105	132	105	114	44	32	....	54
1571	1538	1453	1287	835	993	798	628	446	88	346	271	.....	.....	185	143	105	127	97	119	54	31	72	53

TABLE LXVIII. QUALITATIVE CHARACTERS: INDIVIDUAL RECORDS OF NORFOLK ISLAND MALES

NUMBERS 65-80 ARE BOYS

A	B	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p
1	18	7	15	fr	c	br	g-b	abs	h	cv	tr	m	sm	m	n	m	.....
2	19	8	12	c	m	bl	lbr	abs	m	st	obl	m	m	m	n	p	.....
3	19	14	21	lw	m	bl	dbr	abs	m	cv	obl	v	sm	th	n	r	e-e
4	20	7	11	lw	m	br	g-b	abs	l	st	tr	m	m	th	n	p	e-e
5	22	9	16	fr	c	bl	bl-br	abs	h	cv	obl	m	m	th	n	m	e-e
6	22	9	15	dw	m	dbr	lbr	abs	m	st	obl	l	p	th	....	p	.....
7	22	11	15	st	f	bl	dbr	....	h	cv	a-p	v	sm	m	n	m	e-e
8	22	7	11	c	m	bl	dbr	abs	m	c-c	obl	m	p	m	n	m	.....
9	23	7	14	st	m	br	bl-br	abs	m	st	obl	....	m	....	n	....	.....
10	23	7	10	c	c	bl	bl-br	abs	h	cv	a-p	l	vp	m	n	m	e-e
11	24	3	12	lw	m	dbr	lbr	abs	h	cv	obl	l	p	th	sl	m	e-e
12	24	7	10	st	f	dbr	g-b	abs	h	cc	a-p	l	m	m	n	m	slo
13	25	7	10	st	f	rbr	bl	abs	m	cv	a-p	m	m	m	n	m	e-e
14	26	9	14	lw	m	bl	g-b	abs	h	cv	obl	l	m	th	....	m	e-e
15	26	11	15	dw	m	bl	dbr	abs	h	st	a-p	l	m	m	n	m	.....
16	26	3	11	c	m	r	g-b	abs	h	cv	obl	m	m	tn	n	p	.....
17	29	9	14	st	f	br	bl	abs	m	cv	a-p	m	sm	tn	n	p	e-e
18	30	7	16	dw	m	dbr	bl	abs	h	cv	obl	l	m	m	n	m	.....
19	30	10	16	lw	m	bl	dbr	abs	m	st	tr	....	p	th	n	p	.....
20	31	7	14	st	f	bln	bl	abs	m	st	obl	l	p	tn	...	m	.....
21	32	3	11	st	f	br	lbr	abs	h	st	obl	l	p	tn	n	p	.....
22	33	7	14	fr	c	bl	lbr	abs	h	cv	obl	l	p	m	n	p	.....
23	34	7	13	st	m	bl	g-b	abs	h	cv	a-p	m	m	tn	n	m	.....
24	34	7	10	lw	m	dbr	bl-br	abs	h	st	obl	v	m	m	n	p	u
25	35	3	12	fr	c	bl	dbr	abs	l	cc	tr	v	m	m	n	p	e-e
26	35	7	16	st	f	bl	g-b	abs	m	st	obl	m	p	m	n	p	u
27	36	3	14	st	f	bl	dbr	abs	h	cv	a-p	m	m	m	n	m	slo
28	37	9	15	lw	m	bl	bl	abs	h	cv	tr	l	p	m	sl	p	.....
29	37	10	16	c	c	bl	lbr	abs	h	cv	tr	m	m	m	n	p	.....
30	38	7	16	fr	c	bl	bl-br	abs	h	cv	obl	l	p	m	sl	p	.....
31	38	8	12	st	m	bl	lbr	abs	h	cv	obl	v	p	m	n	p	e-e
32	38	7	15	c	m	bl	lbr	abs	h	st	obl	m	p	th	n	m	.....
33	39	3	10	st	f	bl	bl	abs	m	st	a-p	m	sm	tn	n	m	.....
34	40	9	14	st	m	bl	lbr	abs	h	cv	obl	m	p	m	n	p	.....
35	40	9	18	fr	....	bl	bl-br	abs	m	cv	obl	l	p	th	n	p	.....
36	42	9	14	st	m	bl	dbr	abs	h	cv	obl	m	m	m	n	p	.....
37	42	9	17	st	f	bl	lbr	abs	h	cv	tr	m	m	m	n	r	.....
38	42	9	12	st	f	bl	g	abs	h	cv	obl	m	m	tn	n	m	.....
39	42	9	17	st	f	bl	g-b	abs	h	cv	obl	m	....	m	n	m	.....
40	42	9	15	lw	m	bl	bl-br	abs	h	cv	a-p	l	p	th	n	m	.....
41	43	9	13	st	m	bl	bl-br	abs	m	st	obl	m	p	th	n	p	e-e
42	43	7	13	lw	f	bl	lbr	abs	h	cv	obl	m	m	m	n	p	.....
43	43	8	16	st	....	bl	lbr	abs	h	cv	obl	m	p	th	n	m	.....
44	44	3	13	c	c	bl	bl	abs	m	st	obl	m	p	m	n	r	.....
45	46	9	16	st	f	dbr	g-b	abs	h	cv	obl	l	p	tn	n	m	.....
46	48	9	16	lw	....	bl	dbr	abs	h	cv	obl	m	m	tn	n	p	.....
47	48	9	16	lw	f	bl	g-b	abs	h	cv	obl	m	p	m	n	m	.....
48	51	9	16	st	....	bl	g-b	abs	h	st	obl	m	p	m	n	p	.....
49	52	9	16	st	m	bl	bl-br	abs	h	st	tr	v	sm	m	n	p	slo
50	52	9	16	fr	c	rbr	bl-br	abs	h	cv	obl	m	p	m	....	p	.....
51	53	7	12	lw	m	bl	bl	abs	h	cv	a-p	l	p	m	n	p	u
52	54	7	13	lw	m	bl	lbr	abs	m	cv	tr	l	p	m	n	p	.....
53	55	7	11	st	m	bl	bl	abs	h	cv	a-p	m	m	m	....	m	.....
54	55	7	13	st	m	....	bl	abs	h	cv	obl	v	m	tn	n	p	.....
55	55	10	17	st	f	bl	lbr	abs	h	cv	obl	....	p	m	n	m	.....
56	56	10	18	st	c	....	g-b	abs	m	cv	tr	m	p	m	n	p	.....
57	57	7	14	st	....	....	bl	abs	l	st	tr	m	p	tn	....	p	.....
58	57	7	15	dw	m	bl	bl-br	tr	h	cv	obl	v	m	m	n	p	.....
59	63	....	12	lw	m	....	bl-br	abs	h	cv	obl	m	p	m	n	p	.....
60	66	7	15	st	m	....	g-b	abs	m	st	tr	l	p	th	n	p	e-e
61	67	7	15	st	m	....	g-b	abs	h	cv	tr	l	p	m	n	m	.....
62	72	8	10	lw	....	....	bl	abs	h	cv	tr	l	p	m	sl	p	.....
63	70	12	16	st	....	....	g-b	abs	h	cv	tr	l	p	m	n	m	.....
64	76	9	14	st	....	....	bl-br	....	h	cv	obl	l	p	m	n	m	.....
65	1/2	....	....	dw	f	....	dbe	tr	....	....	....	....	....	....	....	....	.....
66	3/2	7	10	st	m	lbr	dbr	abs	l	cv	a-p	m	sm	m	n	r	.....
67	8	7	13	st	f	bl	dbr	abs	m	st	a-p	v	sm	....	n	....	mo
68	9	10	13	st	f	lbr	g-b	abs	m	st	obl	v	sm	th	n	m	slo
69	10	12	16	st	m	....	lbr	abs	m	st	obl	v	sm	th	n	r	slo
70	11	10	13	st	m	bl	br	tr	l	st	tr	v	sm	th	n	r	e-e
71	11/8	8	14	lw	f	dbr	g-b	abs	l	cc	obl	v	sm	m	n	r	e-e
72	12	7	14	....	f	lbr	g-b	abs	l	cc	obl	m	sm	m	n	m	mo
73	13	7	13	c	m	dbr	bl-br	tr	l	cc	obl	v	sm	th	n	r	slo
74	14/10	9	14	dw	c	bl	dbr	abs	m	st	obl	....	....	....	....	r	mo
75	15	8	11	st	f	bl	br	abs	m	st	obl	v	sm	th	n	m	slo
76	15	9	14	c	m	bl	g-b	abs	h	st	obl	m	m	m	n	p	slo
77	16	9	16	lw	m	bl	bl-br	abs	m	st	tr	v	sm	th	n	r	slo
78	16	9	13	dw	m	bl	g-b	abs	h	c-c	a-p	m	sm	m	n	m	e-e
79	16/9	8	10	st	f	dbr	bl	abs	h	cv	a-p	v	m	m	n	m	u
80	17	9	14	dw	m	bl	dbr	abs	l	cc	tr	v	sm	th	n	m	slo

TABLE LXIX. QUALITATIVE CHARACTERS: INDIVIDUAL RECORDS OF NORFOLK ISLAND FEMALES

NUMBERS 81-99 ARE GIRLS

A	B	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p
81	16	7	10	st	f	lbr	bl	abs	m	cc	obl	m	sm	m	n	m	slo
82	15	2	....	lw	m	bln	bl	abs	h	cv	obl	v	sm	....	....	m	u
83	14	10	12	lw	f	br	bl-br	abs	m	st	obl	v	sm	m	n	m	u
84	14	7	10	st	f	dbr	g-b	tr	h	cv	tr	v	sm	m	n	m	e-e
85	13	7	11	dw	....	dbr	bl-br	abs	m	st	obl	v	sm	m	n	m	slo
86	13	9	12	st	f	bl	dbr	abs	l	cc	obl	v	sm	m	n	r	mo
87	13	9	12	....	m	br	bl	abs	l	st	obl	v	sm	tn	n	m	.....
88	10	9	12	st	f	bl	dbr	tr	l	st	obl	v	sm	m	n	r	slo
89	10	7	11	st	m	dbr	br	abs	l	cc	obl	v	sm	th	n	m	slo
90	9	7	11	lw	f	bl	g-b	abs	l	cc	obl	v	sm	m	n	m	slo
91	9	10	12	lw	f	dbr	g-b	abs	l	cc	obl	v	m	m	n	m	slo
92	7	10	13	lw	m	bl	dbr	abs	m	st	obl	v	sm	m	n	m	slo
93	7	8	12	st	f	dbr	g-b	abs	m	st	obl	v	sm	....	n	r	slo
94	7	7	10	st	f	bl	br	abs	l	cc	obl	v	sm	th	n	r	slo
95	6	7	9	c	....	dbr	bl-br	tr	l	cc	....	v	sm	....	n	....	e-e
96	5	10	11	st	f	dbr	g-b	abs	l	cc	obl	v	sm	m	n	r	slo
97	4	....	....	st	f	dbr	dbr	abs	l	cc	obl	v	sm	m	n	r	.....
98	3	7	10	st	f	bln	bl	abs	l	cc	obl	m	sm	m	n	r	u
99	1/5	2	4	lw	f	lbr	g	m	l	cc	tr	m	sm	m	n	m	u
00	87	....	12	st	m	dbr	bl-br	abs	h	cv	a-p	m	p	m	n	p	.....
01	81	....	....	dw	....	....	bl-br	....	....	cv	tr	m	p	....	n	m	.....
105	17	7	10	fr	c	rbr	bl	abs	m	cv	obl	v	sm	th	n	m	u
106	17	10	16	st	m	bl	dbr	tr	l	cc	a-p	v	sm	th	n	m	e-e
107	17	2	10	lw	m	dbr	dbr	....	m	st	obl	m	sm	m	n	m	u
108	19	7	13	st	f	bl	lbr	abs	l	st	obl	v	sm	tn	n	p	.....
109	19	3	9	st	f	bln	g-b	abs	m	cc	obl	v	sm	m	n	p	slo
110	19	7	....	dw	m	br	lbr	abs	m	st	a-p	v	sm	m	n	....	u
111	20	7	10	st	f	dbr	g-b	abs	l	st	a-p	v	sm	m	n	p	slo
112	21	3	10	lw	f	bl	g-b	abs	m	st	obl	v	sm	tn	n	m	slo
113	22	9	12	st	f	bl	dbr	....	l	st	....	v	sm	m	....	....	u
114	23	7	9	c	c	dbr	g-b	abs	h	cv	obl	l	p	th	n	p	.....
115	25	7	10	lw	f	rbr	g	abs	m	st	obl	v	sm	m	n	p	.....
116	25	....	12	st	f	bl	dbr	abs	h	cv	a-p	v	sm	m	n	p	.....
117	26	9	12	st	f	dbr	dbr	abs	m	st	a-p	v	sm	tn	n	m	.....
118	26	9	12	lw	m	bl	dbr	abs	m	cc	obl	m	m	th	n	m	.....
119	27	7	11	st	f	bl	lbr	abs	m	st	obl	m	sm	m	n	p	.....
120	31	7	12	fr	m	bl	dbr	abs	m	cv	obl	v	m	m	n	m	e-e
121	32	7	11	st	m	bl	bl-br	abs	h	st	a-p	v	m	m	n	m	.....
122	32	9	15	fr	c	bl	g-b	abs	l	cc	obl	v	sm	th	n	p	.....
123	33	7	10	st	m	rbr	dbr	abs	m	st	obl	v	sm	tn	n	m	.....
124	33	7	12	lw	f	br	g-b	....	l	cc	a-p	v	sm	tn	n	m	u
125	34	7	10	lw	m	dbr	g-b	abs	h	cv	a-p	v	m	m	n	m	u
126	34	9	11	st	f	dbr	bl	abs	h	cv	obl	l	sm	th	sl	r	slo
127	34	7	9	st	f	dbr	bl-br	abs	m	cv	tr	v	sm	m	....	p	.....
128	35	7	14	fr	c	bl	g-b	abs	m	cc	a-p	v	m	th	n	p	.....
129	36	7	14	lw	f	bl	g-b	abs	m	st	a-p	v	sm	m	n	p	.....
130	37	7	13	st	m	bl	dbr	....	m	cc	obl	v	p	m	n	m	.....
131	39	9	12	lw	f	br	bl	abs	h	st	a-p	m	sm	m	n	p	.....
132	40	7	11	c	c	bl	lbr	abs	h	cv	a-p	v	sm	m	n	p	.....
133	40	9	13	lw	m	bl	dbr	abs	m	st	a-p	v	sm	m	n	m	....
134	41	3	10	st	m	bln	g-b	abs	h	st	a-p	m	m	tn	n	m	.....
135	42	2	7	lw	m	dbr	dbr	abs	m	cv	a-p	v	sm	m	n	p	.....
136	43	7	13	st	f	bl	g-b	abs	m	cv	obl	v	sm	m	....	m	mo
137	44	10	12	lw	m	bl	g-b	abs	l	st	tr	m	m	m	n	m	.....
138	44	7	12	st	f	bl	bl-br	abs	m	st	a-p	m	p	m	n	p	.....
139	45	....	10	lw	f	br	bl-br	abs	h	cv	obl	v	m	tn	n	p	.....
140	46	7	10	st	m	br	bl-br	abs	m	st	obl	v	sm	....	n	....	.....
141	47	7	8	lw	c	br	bl-br	....	m	cv	obl	v	m	m	n	p	.....
142	48	7	9	st	m	bl	g-b	abs	l	....	obl	v	sm	m	....	m	.....
143	48	7	12	st	....	bl	dbr	abs	m	st	obl	v	....	m	n	....	.....
144	52	7	13	lw	c	bl	bl-br	abs	h	cv	a-p	m	m	tn	n	p	.....
145	53	9	11	dw	....	lbr	bl-br	abs	m	cv	obl	v	m	m	n	....	.....
146	56	10	14	lw	f	bl	bl-br	abs	m	st	obl	m	m	m	n	r	.....
147	57	9	13	st	m	bl	bl-br	abs	m	cv	obl	v	sm	m	n	p	.....
148	59	7	13	dw	m	bl	bl-br	abs	h	cv	obl	v	p	m	n	p	.....
149	63	7	13	dw	....	bl	dbr	abs	m	cv	obl	m	m	th	n	m	.....
150	64	9	13	fr	c	bl	g-b	abs	m	cv	tr	m	m	th	n	m	.....
151	65	9	14	st	f	bl	dbr	abs	h	cv	obl	m	m	m	n	m	.....
152	68	....	14	dw	c	....	dbr	abs	m	cv	....	m	p	th	....	m	.....
153	69	7	11	st	f	....	g-b	abs	h	c-c	a-p	m	m	m	n	p	.....

TABLE LXX. QUALITATIVE CHARACTERS: INDIVIDUAL RECORDS OF BRITISH FEMALES

A	B	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p
102	24	1	....	st	f	bln	dbr	abs	h	cv	a-p	v	m	tn	n	....	e-e
103	58	7	10	st	f	bl	g-b	abs	m	st	a-p	v	sm	tn	n	m	.....
104	54	7	11	lw	....	lbr	g-b	abs	m	c-c	a-p	v	sm	m	n	m	.....

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b. 1774 JOHN ADAMS d. 1829
m.
1) Bal'hadi (Tahitian)
2) Mary (Sore Mummy) (Tahitian) d. 1829

- b. 1796 Dinah
  - 1797 Rachel (Rebecca)
  - 1800 Hannah
- b. 1804 George
  m. April 1, 1827
  1) Polly Young d. 1843
  2) Sarah McCoy (widow) d. 1852
  - A
    - b. Nov. 10, 1827 John
      m. April 6, 1843
      Caroline Quintal
  - B
    - b. 1829 Johnathan
      m. April 9, 1848
      Phoebe Quintal
  - C
    - b. 1830 Josiah
      m.
      Diana McCoy

A

b. Nov. 10, 1827 John
m. April 6, 1843
Caroline Quintal

- b. 1844 Pauline
  Augusta
  Elizabeth
  Thomas
  Hastings
  Phyllis
- b. 1845 Fysh
  m.
  Fanny Quintal
  - John
    m.
    1) Elizabeth Christian
    2) Clara Christian
    - 1) Mary
      Warren
      John
    - 2) Elizabeth
      Sarah
      Constance
  - b. 1868 Gilbert (54)
    m.
    Elizabeth Quintal
    - Leslia
      Catherine
      William
      b. 1898 Madeline Helen (115)
  - Madeline
- b. 1847 Byron
  m.
  Edith McCoy
  - Celia
    Audley
    Amabel
    Viola
    Annie
    Ellen
  - b. 1879 Thomas (44)
    m.
    Elsie Nobbs
    - No issue
  - b. 1881 Augustine (40)
    m.
    Violet Quintal
    - No issue

A

b. Nov. 10, 1827 John
m. April 6, 1843
Caroline Quintal

- b. 1849 Webb
  m.
  1) Abigail Christian
  2) Martha Quintal
  - Delia
    Elizabeth
    Craddock
    Maria
    Gregorie
    Abigail
    Elizabeth
  - Holford
    m.
    Madeline Christian
    - Harold
      Muriel
- b. 1851 William
  m.
  Sarah Christian
  - Henry
    m.
    Caroline Christian
    - No issue
  - Meade
    m.
    Charlotte McCoy
    - Hagar
      Lara
      Dillon
      Fysh
  - Grace
    Mary
    Willoughby
    William
  - Fysh
    m.
    Greena Christian
- b. 1867 Tilly (56)
  m.
  Rosecleer (Snell) Quintal
  - George

B

b. 1829 Jonathan
m. April 9, 1848
Phoebe Quintal

- b. Nov. 15, 1848 Calvin
  1849 Seabury
  1851 Isabel
  Ross
  Cleveland
  1854 Jonathan
  Annie
  Anabella
  Kate
- Marsh
  m.
  Mary Christian
  - Catherine
    Albina
    Priscilla
    Lorenzo
    Emeline
    Salter
- John
  m.
  Annie Timothy

C

b. 1830 Josiah
m.
Diana McCoy

- Margaret
  Mary
  Mary Ann
  Sarah
  George
  Edna
  Ann
  Jane
  Herbert
- Alfred
  m.
  ..... New South Wales
  - Sarah
- Guildford
  m.
  Amy Christian
  - Caroline
    Eustace
    Margaret
    b. 1897 Ephraim (14)
    Maria
    1901 Patteson (7)

FLETCHER CHRISTIAN
m.
ISABELLA "MI-MITTI" (Main mast, mai-mast)

A

b. 1790 Thursday October d. Apr. 21, 1831
m.
Sussannah (Doubit), the widow of Young

B

b. 1792 Charles d. 1842
m.
Sarah (Sully) a Tahitian d. 1826

b. 1793 Mary ("Lass'o")

A

b. 1790 Thursday, October d. Apr. 21, 1831
m.
Sussannah (Doubit), the widow of Young

b. 1808 Charles d. 1831
m. Oct. 18, 1829
Maria Christian

p 7, 1830 Rebecca (Pot)

b. 1831 Charles Driver
m. July 5, 1855
Lucy (Oty) Christian

Emily
Evelina
John
Nancy
Charles (Tony)
Greena

Timothy
m.
Maud McKnight

Caroline
Sarah
Edward
Brookes
Clara
Nancy
Constance
Mary (Tilling)

b. 1808 Joseph d. 1832
1811 Mary (big Melly) d. 1852
1814 Polly d. 1831
1815 Peggy

b. 1820 Thursday October (Doctor)
m. 1839
Mary (Jackanaily) Young

b. 1840 Julia
1841 Agnes
1848 Annie d. 1851
Saidley
1843 Albert
1845 Elias
1855 Daniel
1853 Heywood
Frank
William

b. 1846 Alfonso
m.
1) Sarah McCoy
2) Alice H. Christia

B

b. 1792 Charles d. 1842
m.
Sarah (Sully) a Tahitian d. 1826

C

18 (5) Fletcher d. 1852
m. Jan. 17, 1833
Peggy (Christian) McCoy

b. 1810 (3) Sarah (big Salah)
1814 Edward d. 1831
1815 Maria
1822 Margaret
1819 Mary d. 1843

D

b. 1818 Charles (little Charlie)
m. Oct. 30, 1836
Charlotte Quintal

E

b. 1825 Isaac
m. July 31, 1844
Miriam (Miliam) Young

C

b. 1812 (5) Fletcher d. 1852
m. Jan. 17, 1833
Peggy (Christian) McCoy

b. Sept. 24, 1833 Jacob
m. Aug. 10, 1851
1) Nancy Quintal d. 1853
2) Maria Christian

M 20, 1853 Chads
Caroline
Eugene
Lucy
Wallace
Sophia
William
Elizabeth

Holder
m.
Mary Quintal

Stephen
m. 1914
Rita Lawrence (Australian) (102)

b. 1915 Stephen (67)
1920 Holder (66)

Ruth
Walter

b. 1835 Priscilla
1836 Polly
1838 Lucy
1839 Emily
1849 Abigail
1847 Swain
1841 Stephen d. 1842
1845 Nathan

b. 1843 Stephen
m.
Ellen Quintal

Grace
Julia
b. 1901 John (5)
Beatrice
Stephen
Laura
Swain

D

b. 1818 Charles (little Charlie)
m. Oct. 30, 1836
Charlotte Quintal

- b. 1856 Reuben
  m. 1869
  Anna Wallen (104)
  - b. 1887 Charles (27)
  - 1889 Howard (23)
  - Elizabeth
  - 1902 Dorothy May (112)
  - Holman
  - Reuben
  - 1907 Ernest Selwyn (78)
  - 1910 Edith (86)
- b. Dec. 16 1837 Andrew d. 1837
  - Leonard
  - 1839 Catharine
  - 1841 Andrew
  - 1842 Adeline
  - 1846 Eleanor
  - 1848 Cordelia
  - 1849 Hagar
  - Maria
  - 1853 Holman
  - 1852 Wellesley
- b. 1844 Gilbert
  m.
  Jemima Nobbs
  - Edwin
  m.
  Edwina Nobbs
  - Ethel
- Howard
  m.
  Amy (Dinah Amabel) Quintal
  - Henry
- b. 1855 Allen
  m.
  Norah Nobbs
  - b. 1880 Charles (43)
  m.
  Christabel Christian
  - Mary
  - b. 1885 Nash (32)
  m.
  Emily Quintal
  - b. 1922 Alexander (65)
  - Adeline
  - Clara
  - Brightie
  - b. 1886 Frank (28)
  - 1892 Mary Norah (120)
  - John
- Selwyn
  m.
  Augusta Buffett
  - Gertrude

E

b. 1825 Isaac
m. July 31, 1844
Miriam (Miliam) Young

- b. 1847 Emeline
  - Denham
  - Acland
  - Malvinia
  - Mary
  - Gertrude
  - Florence
  - Ruth
  - Dorcas
  - Emmeline
- b. Oct. 4, 1845 Hunt
  m
  1) Eleanor Christian
  2) Alice Maude Christian
  - Elsie
  - Angela
  - Pearl
  - Elizabeth
  - b. 1894 Carty (17)
  - 1889 Ellen Louise (126)
  - Sanford
  - b. 1884 Isaac (Goldie) (33)
  m.
  Clara Ami Bataille
  - b. 1903 Albert Louis (4)
- b. 1849 Godfrey
  m.
  Fanny Edwards
  - Linda
  - Nita
  - William
  - Amabel
  - Sarah
  - Rene
  - Charles
  - Glynn
  - Francis
- b. 1851 Leonard (62)
  m.
  1) Mary Buffett
  2) Jane Nobbs
  - Thomas
  - b. 1883 Christbel (132)
  - Beaumont
  - John
  - Montague
  - Dorcas
  - Muriel
- b. 1853 Parkins
  m.
  Rose Adams
  - Grisley
  - Albert
  - Magnolia
  - Howland
  - Lucinda
  - James
  - Miriam
- Ernest
  m.
  Florence Buffett
  - Pearl
  - Sidney
  - Oscar

MATTHEW QUINTAL
m.
SARAH (Big Sullee)

A

b. 1791 (2) Matthew d. 1814
m.
Elizabeth Mills

- b. 1811 John d. 1838
  m. Jan. 17, 1833
  Maria (Christian) Christian
  - b. June 10, 1833 Eliza
  - April 5, 1835 Sarah
  - 1837 Ellen
  - 1838 Maria
- b. 1813 Mathew

B

b. 1795 Arthur
m.
1) Katharine McCoy d. 1831
2) Mary Christian d. 1843

- C 1
  b. 1818 William
  m. June 7. 1840
  Maria (Christian) Quintal
- C 2
  b. 1822 Martha
  - 1824 Edmond d. 1856
  - 1829 Louisa
  - 1831 Nancy
  - 1833 Susan
  - 1839 Napoleon d. 1841
- C 3
  b. 1827 Abraham
  m. Dec. 25, 1848
  Esther Nobbs
- C 4
  b. 1836 Henry
  m.
  Jane McCoy
- C 5
  b. 1837 Caleb
  m.
  Ann Nobbs

b. 1794-9 Jane
1797 Sarah

C

b. 1800 Edward d. 1841
m.
Dinah Adams

B

b. 1795 Arthur
m.
1) Katharine McCoy d. 1831
2) Mary Christian d. 1843

- B 1
  b. 1816 Arthur
  m. Oct. 22, 1837
  Martha Quintal
- B 2
  b. 1818-19
  1822
  1824
  1827
  1829
  1831
  Catherine d. 1831
  Charlotte
  Phebe
  Caroline
  Ruth
  Lucy Ann d. 1831
- B 3
  b. 1820 John
  m. Nov. 5, 1837
  Dinah Young
- B 4
  b. 1825 James
  m. July 22, 1855
  Priscilla Christian
- B 5
  b. June 17, 1836 Absolam
  m.
  Mary
- B 6
  b. 1837 Nathaniel
  m.
  Tabor Quintal
- B 7
  b. 1839 Joseph
  m.
  (1) Martha Evans
  (2) Emily Christian
- B 8
  b. 1841 Cornelius
  m.
  Ellen Moore

B 1

b. 1816 Arthur
m. Oct. 22, 1837
Martha Quintal

- b. July 31, 1838 Edward
  m.
  Angeline McCoy
  - Edmund
    m.
    Elizabeth Snell
    - Henry
    - Rene
    - Lara
  - b. 1875 Albert (46)
    m.
    Dorothy Buffett
    - Young
    - Alan
    - Catharine
    - b. 1901 John (8)
    - 1904 Glynn (108)
    - Angeline
    - Melissa
    - 1919 Olive Hilda (97)
  - Caleb
  - Lara
  - b. 1891 Blanche (122)
  - Louis
    m.
    ..... (N. Z.)
    - Edward
    - Angeline
  - b. 1885 Ellis (30)
    m.
    Nesta Nobbs
    - Amelia
    - George
    - William
  - b. 1866 Swain (29)
    m.
    Amy Young
  - Edmund
  - b. 1839 Victoria
  - 1849 Hope
  - 1842 Rhoda
  - 1851 Julia
  - 1846 Edmund
  - Martha
  - Wallace
  - Hugo
- b. 1848 William d. 1852
  m.
  Eleanor Quintal
  - Martha
  - Esther

B 2

b. 1818-9 Catharine d. 1831
1822 Charlotte
1824 Phebe
1827 Caroline
1829 Ruth
1831 Lucy Ann d. 1831

B 3

b. 1820 John
m. Nov. 5, 1837
Dinah Young

- b. Dec. 23, 1838 John
  m.
  Dinah Evans
  - George
    m.
    Alice Clare
    - Olive
    - George
    - Anderson
  - Caroline
    Mary Ann
    Landers
  - John Wilfred
    m.
    Susan Quintal
    - b. 1898 Wilfreda (116)
  - Percy
    m.
    Bella Quintal
    - Ralph
    - Kate
    - William
- b. 1840 Augusta
  1841 Matilda
  1843 Kezia
  1844 Levi d. 1846
  1849 Hannah
  1851 Sarah
  Melbourne
  1854 Nancy
  Oliver

B 8

b. 1841 Cornelius
m.
Ellen Moore

- b. 1870 Henry (51)
  m.
  Francis Quintal
  - Constance
  - Roy
- b. 1871 Susan (144)
  1876 Mary (141)
  1878 Elizabeth (138)
  Amy
  1881 Ruth (135)
  Arthur
- Hastey
  m.
  Rose Yager
  - Frederick
  - Helen
  - Ethel
  - Mary

B 4

b. 1825 James
m. July 22, 1855
Priscilla Christian

- Pitcairn
  Gorham
  Gorham
  b. 1856 Priscilla
- b. 1857 Patteson (60)
  m.
  Mary Quintal
  - b. 1877 Agnes (140)
    Amelia
    Codrington
    Edgar
    Elizabeth
  - Hedley
    m.
    .....N. Z.
    - Hedley
  - b. 1893 William (19)
    m.
    .....California
- Robert
  m.
  Elizabeth Quintal
  - Martha
  - Catharine
- b. 1872 Nathan (48)
  m.
  Estella Bataille
  - Yvonne
  - Phebe
  - Albert
  - b. 1912 William (70)
  - 1914 Frederick Walter (68)

B 5

2) b. June 17, 1836 Absolam
1843 Mary

B 6

b. 1837 Nathaniel
m.
Tabor Quintal

- George
  m.
  Gertrude Christian
  - Gertrude
  - b. 1887 Clarabel (129)
  - Nini
  - Nelly
  - Roxy
- Ada
- Helen
- Elizabeth
- Annie
- Abby
- Constance
- Maria
- Augusta
- Nicholas
- Atkins
  m.
  Bella Adams
  - Stephen
  - Byron
  - Nathaniel
  - Edward
- Gilbert
  m.
  Agnes Evans
- Thomas
  m.
  Margaret Menges

B 7

b. 1839 Joseph
m.
1) Martha Evans
2) Emily Christian

- Elizabeth
- Rachel
- Elizabeth
- Maude
- Mary
- Adeline
- b. 1871 William (50)
- Walter
- Frank
- Joseph
- Phelps
- Edward
- Welchman
- Hayward
  m.
  Elizabeth Clough
  - Eadie
  - Nina
  - Cecil
  - Lysh
  - Ivor
  - b. 1892 Albert (20)
    m.
    Madeline Olive Adams
    - b. 1920 Nina Olive (98)
    - 1922 Hazeldene (99)
- b. 1866 Henry (57)
  m.
  Ada Quintal

C 1

b. 1817 William
m. June 7, 1840
Maria (Christian) Quintal

- b. Jan. 1, 1841 John
  m.
  Jane Nobbs
  - Dora
  - Bertha
  - William
  - Archibald
  - Bella
  - Esther
  - Reuben
  - b. 1878 Frances (139)
- b. 1846 Tabor
  1848 Helen
  1851 Fanny
  1844 Edward d. 1855
  1853 Maude
  Rosalind
  1855 { Mary, Amelia } twins
  Sarah
  Martha
- b. 1842 Macey
  m.
  Jemima Buffett
  - Laurie
  - Oliver
- Gregory
  m.
  Jane Buffett
  - Violet
  - Austin
  - Charles
  - Macey
  - Archibald
  - b. 1889 Emily (127)
  - Edwin

C 2

b. 1822 Martha
1824 Edward d. 1856
1829 Louisa
1831 Nancy
1833 Susan
1839 Napoleon d. 1841

C 3

b. 1827 Abraham
m. Dec. 25, 1848
Esther Nobbs

- b. 1851 Fairfax
  m.
  Sarah Quintal
  - Lillian
  - Lorna
  - Rita
- b. 1853 John
  m.
  Harriet Cawthray
  - John
  - Esther
  - Roy
- b. 1856 Henry
  m.
  Nancy Quintal
  - Stephen
  - Harriet
  - Emily
  - Prudence
  - Acland
  - Dinah
  - b. 1889 George (24)
  - Penny
    m.
    Linda Christian
- Harriet
- Mary
- Eunice
- Eleanor
- b. 1870 Jemima (145)
- 1875 Emily (143)
- Walter
  m.
  Mary Christian
  - Charles
  - Driver
  - Krisman
  - Harold
- Gustav
  m.
  Eleanor McCoy
  - Charles
  - Thornton
  - Muriel
  - Christine
  - Ellen
  - Edgar
  - b. 1881 Leslie (36)
    m.
    Beatrice Yager
    - Ada
    - Bertha
    - Robert
    - Frederck
- Charles
  m.
  Elizabeth Henderson
  - Esther
  - Abraham

C 4

b. 1836 Henry
m.
Jane McCoy

- b. 1859 Amabel (150)
- Burleigh
- Frances
- Julia
- Sarah
- Matthew
  m.
  Mary Ann Quintal
  - Henrietta
  - Helen
  - Amabel

C 5

b. 1837 Caleb
m.
Ann Nobbs

- Perry
- Maude
- Esther
- Lillian
- Douglas
  m.
  Ida Buffett
  - Maude
  - Ida
- Arthur
  m.
  Rosecleer Snell
  - Alfred
  - Caleb
  - Gascoigne
  - Helen
- Fletcher
  m.
  Alice Nobbs
  - Johnstone
  - Rona
  - Emily

GEORGE HUNN NOBBS
m. Oct. 18, 1829
SARAH CHRISTIAN

A
b. 1833 Fletcher
m. June 20, 1853
Susan Quintal

b. Sept. 19, 1830 Reuben
1832 Esther
1836 Jane (100)
1838 Ann
1845 Jemima
1843 Edwin
Alice

B
b. 1835 Francis
m.
Augusta Quintal

C
b. 1839 Johnston
m.
Emily Christian

D
b. 1846 Alfred
m.
Emily Christian

E
b. 1848 Sidney
m.
Dora .....Canada

A

b. 1833 Fletcher
m. June 20, 1853
Susan Quintal

b. 1854 Kathleen (152)
1856 Louisa
Janet
Martha

Charles
m.
Agnes Allen
- Constance
- Valerie
- Gordena
- Geraldena
- Henry
- Ivy
- Eileen
- b. 1901 Christine (113)
- Ray
- 1904 Nea (110)
- William
- 1908 Mary (82)
- Richard
- Joan
- Ronald
- Charles

b. 1866 George (58)
m.
Amelia Evans
- Nesta
- Iris
- b. 1891 Agnes (121)
- George
- 1897 Ivan (16)

Christian
m.
Gertrude Christian
- Augusta
- Helen
- Pearl

Branker
m.
Sybil King (New South Wales)
- Mercia
- Fletcher
- Adrian
- Herbert
- Jeffrey

B

b. 1835 Francis
m.
Augusta Quintal

Emily
Thomas
Sarah } twins
Harriet
1866 Jane (147)
Sarah
Mildred

Rawdon
m.
Emily .....(Queensland)
- Mildred
- Augusta
- Eva
- Gladys
- Rawdon
- Edwina
- Marjory

Reuben
m.
Maude (New South Wales)
- Lois

b. 1868 Alexander (55)
m.
Lillian Quintal
- Naomi

C

b. 1839 Johnston
m.
Emily Christian

b. 1858 Eleanor (151)
1860 Nora (149)
Sarah
Gladys
Alice
Edith

Maurice
m.
Dora Quintal
- b. 1890 Mabel (123)
- Emily
- Johnston
- Helen
- Kathleen
- Oakley
- Edith
- Ruby

Edwin

Edgar
m.
Blanche Buffett
- Aldina
- Marion

Horace
m.
Mary (N. S. W.)
- Emily

Henry
m.
Eleanor Young

b. 1883 Joseph (35)
m.
Mary Buffett

D

b. 1846 Alfred
m.
Emily Christian

Helena
Elizabeth
Clara
b. 1882 Eliza (134)
Maria

Sidney
m.
Amabel Adams
- Amabel

Benjamin
m.
Amy Quintal
- Richard
- Henry
- Joseph
- Ellen
- Florence
- Jane
- Edna

Francis
m.
Ruth Christian
- Helena
- Elsie
- Alice
- Cyril
- b. 1906 Emmeline (106)
- Oswell
- Jessie
- 1913 Olive (88)
- Florence
- 1916 Margaret (93)

E

b. 1848 Sidney
m.
Dora .....Canada

Christine
Rona
Herbert
Daisy

JOHN BUFFETT
m. Feb. 10, 1824
DOROTHY YOUNG

A
b. Jan. 1825 Thomas
m. June 20, 1853
1) Louisa Quintal
2) Dorcas Young

B
b. 1826 John
m. Oct. 12, 1845
Elizabeth Young

C
b. 1830 Robert Pitcairn
m.
Lydia Young
no issue

D
b. 1828 David
m. Jan. 23, 1851
1) Martha Young
2) Maria Christian

E
b. 1835 Edward
m.
Victoria Quintal

A

b Jan. 1825 Thomas
m. June 20, 1853
1) Louisa Quintal
2) Dorcas Young

1) Mary
b. 1856 Selina
Thomas
Fanny
Florence
Claude
Inship
2) Elizabeth
Ellen

b. 1860 Henry (59)
m.
Harriet Nobbs

Francis
Augusta
b. 1899 Reginald (11)

John
m.
Dinah Quintal

Alice
Mary
b. 1909 Henrietta (84)
Pearl
Henry
Thomas

B

b. 1826 John
m. Oct. 12, 1845
Elizabeth Young

b. May 7, 1847 Seymour (64)
m.
Selina Buffett

John
b 1880 Edith (136)
Alice
Henry
Campbell
Cameron
Catherine
Victoria
Grey
Olivia
Stanley
Thomas

Lindsay
m.
Lydia—
Solomon Island

b. 1849 Eva
1853 Evangeline
John
Augusta
Ida
Charles

b. 1851 Allen
m.
Kathleen Nobbs

Hilda
Elizabeth
b. 1875 Dorothy (142)
1897 Hannah (118)
Kerenhappuck
Fletcher

Charles
m.
Mary Knight

Dominicus
Gabriel

b. 1883 Peter (34)
m.
Gertrude Evans

George
Arthur
Charles
Dora

C

b. 1830 Robert Pitcairn
m.
Lydia Young
no issue

Lindsay
m.
b. 1865 Ann Taylor (English) (103)

b. 1884 Helen (131)
1886 May (130)
Clifford
Claude
Alice
b. 1899 John (12)
1907 Florence (81)

Young
m.
Bertha Quintal

Oswald

b. 1885 George (31)
m.
Gladys O'Br
New Zealand

Leslie
Neville
Floriettè
Pearl

D

b. 1828 David
m. Jan. 23, 1851
1) Martha Young
2) Maria Christian

1) b. Sept. 5, 1851 Austin
Charles
Jane
Jemima

b. 1853 Fortescue (63)
m.
Emma Quintal

Louisa
Martha
Steel
Blanche
Olive
Marion
Janet

David
m.
Susan (Quintal) Quintal

Moresby
Gilbert
b. 1908 Austin (76)
1914 (Valerie (90)
1914 (Florence (91) twins
b. 1916 Martha (92)

b. 1856 Ward (61)
m.
Eleanor Nobbs
no issue

Edwards
m.
Gladys Nobbs

Emily
Theresa
Robert
Hardie
Kate
Hester
Ward
Wingate
Charles

George
m.
1) Margaret Adams
2) Reubena Buffett

1) Elizabeth
Jemima
May
2) Victoria

John
m.
Agnes—N. Z.

2) Christopher
m.
Satie Robinson

Hannah
Isaac

E

b. 1835 Edward
m.
Victoria Qui

Mary
Fletcher
Reubena
Louisa

Arthur
m.
Sarah N

EDWARD YOUNG
m. 1) Ta-ou-piti
2) Mi-mitti widow of Christian
3) Nancy, widow of a Tahitian

- b. 1797 George d. 1831 m. Hannah Adams
  - b. 1822 Frederick m. Mary Evans Dec. 25, 1849
    - John m. Louisa Nobbs
      - (42)
      - Rupert
    - b. 1854 Emily (153)
      - 1851 Charles
      - Alfred
      - Catherine
      - Ellen
      - Bertha
      - Charlotte
      - George
      - Charles
    - Frederick m. Esther Quintal
      - Wilfred
      - b. 1896 Kathleen (119)
- b. 1799 Robert d. 1831
- b. 1797 Edward d. 1831 m. Polly b. 1814 d. 1831
  - b. 1824 Dinah
    - 1826 Elizabeth
    - 1828 Jemima
    - 1830 Martha
- b. 1797 Dorothy
  - 1796 Polly
  - 1794-9 James d. 1808
  - b. 1828 Simon m. Mary Christian (Buffett) July 31, 1845
    - b. Nov. 2, 1847 Eliza
    - Jan. 27, 1846 Fisher
    - 1850 Robert
    - 1851 Stanley
    - 1853 Rosalind
    - 1855 Mary Ann
    - Edward
    - Esther
    - Sarah
    - John
    - Alfred
    - Arthur
- b. 1799 William d. 1839 m. Elizabeth (Mills) Quintal
  - b. 1825 Mary
    - 1829 Miriam
    - 1837 Robert d. 1837
    - 1832 Dorcas, Lydia
  - b. 1823 Mayhew d. 18

JOHN EVANS
m. Nov. 26, 1924
RACHEL ADAMS

- hn
- ary
- inah
- artha
- b. Aug. 3, 1830 William m. Jan. 22, 1854 Rebecca Christian
  - a
    - (148)
    - b. 1855 Hodson m. Sophia Christian
      - Alice
      - Charles
      - William
      - Herbert
    - Charles m. Clara Nobbs
    - Fuller m. Elizabeth Quintal
      - Eleanor
      - John
      - George
      - Medley
    - Frank m. Sophia Christian
      - Bell
      - Elizabeth
      - Vena
      - Charles
- b. 1835 George m. Catherine Christian
  - Richard
  - Clara
  - 1854 Agnes
  - Gertrude
  - Roland m.
    - 1) Evangeline Buffett
    - 2) Jane Adams
      - 1) Richard, Edwin, Ida, George
      - 2) Guildford, Alice, Forest, Ernest, Joyce, Young
  - Andrew m. Phoebe Batai (Fren
    - Elizabeth
    - Albert
    - Andrew
    - b. 1907 Richard (77)
    - Emma

WILLIAM McCOY
m.
MARY (Sore Mummy)

- b. 1791 (2) Daniel d. 1832 m. Sarah (Seldarb) Quintal d. 1833
  - b. 1814 Daniel d. 1831 m. Oct. 18, 1829 Peggy Christian
    - b. Aug. 18, 1830 Philip
    - Dec. 13, 1852 m.
    - 1) Sarah Quintal
    - 2) Hagar Christian
      - b. 1852 Edith
      - 1854 Angeline
      - Amabel
      - Eleanor
      - Lara
      - Perry
      - Augustine
      - Charlotte
      - Perry
      - Elizabeth
      - Hagar
      - Louise
      - Stanley m. Helena Nobbs
        - Emily
        - Alfred
        - Mary
        - Minto
        - Alice
        - Melvina
      - Christian m. Elizabeth Nobbs
        - Augustine
        - Whitely
        - Cecil
        - Eric
        - James
        - b. 1910 Walter (73)
        - Mildred
        - Clara
  - b. 1813 William d. 1848
    - 1816 Hugh 1831
    - 1822 Jane 1831
    - 1824 Sarah 1833
    - 1828 Albina
    - 1832 Daniel
  - b. 1819 Matthew d. 1853 m. Oct. 20, 1836 Margaret Christian
    - b. 1837 Jane
    - 1838 Diana (Dinah)
    - 1841 Mary (101)
    - 1843 Sarah
    - 1845 Russell
    - 1847 Harriet
    - 1848 Sophia
    - 1851 Mary Ann
    - 1853 Holman (f)
  - b. 1871 Michael (49) m. Elsie Christian
    - Ruth
    - Daniel
    - Goldie
    - Rita
  - b. 1826 Samuel m.
    - 1) Ruth Quintal
    - 2) Polly Christian
      - 1) Amelia, Russell
      - 2) Harriet, Jacob
  - Philip m. Mary Christian
    - b. 1897 Victor (15)
    - 1901 William (6)
    - 1903 Elizabeth (111)
  - b. 1881 Fisher (39) m. Florence J. Johnson N. Z.
    - b. 1911 Charles (72)
    - 1913 Cyril (69)
- b. 1800 Catherine
- b. 1790 Sarah d. 1826
- Daniel d. 1832?

JOHN BUFFETT [1]
MARY CHRISTIAN (Big Melly)

- A
  - b. 1832 Benjamin Christian m. Dec. 25, 1851 Eliza Quintal
- b. 1828 Mary Christian
- B
  - b. 1845 Ephraim Christian m. Pauline (Polly) Adams

A

b. 1832 Benjamin Christian
m. Dec. 25, 1851
Eliza Quintal

- b. 1852 Emily
  - Sarah
  - Alice Maud
  - Herbert
- b. 1854 Richard m. Isabel Adams
  - Mercy
  - Kate
  - Eliza
- Julius m. Bertha (Quintal) Buffett
  - b. 1898 Herbert (13)
  - Starr
- b. 1868 Fisher (53) m. Maude Quintal
  - Charles
  - Julius
  - b. 1893 Benjamin (18)

B

b. 1845 Ephriam Christian
m.
Pauline (Polly) Adams

- Amy
- b. 1867 Mary (146)
  - Victor
  - 1883 (Anna) Maria (133)
  - 1888 Elizabeth (128)
- b. 1882 Austin (38) m. Elizabeth McCoy
- b. 1871 Eustace (52) m. Lara McCoy
  - Madeline
  - Ephraim
  - Edith
  - Wesley
  - Polly
- b. 1881 Brightman (37) m. Josephine Bataille
  - Victorine
  - Albert
  - b. 1909 Gilbert Augustine (74)
  - 1912 Alex (71)

[1] Illegitimate union.

ISAAC ROBINSON (English)
m.
HANNAH QUINTAL

- b. 1890 Harriet Fairfax Sattie (124)
- 1888 John Selwyn (26)
- b. 1875 Enoch Cobbcroft (47) m. Eliza Jemima Nobbs
  - b. 1910 Esther Sylvia (85)
  - b. 1917 Audrey Pearl (95)

ROBERT HENRY EDWARDS (Born in Falmouth, Mass.)
m.
ENGLISHWOMAN OF NEW ZEALAND

- William Ezra m. Ann Adams
  - b. 1906 Hazel (107)
  - b. 1904 Harold William (2) m. Mary Norah Christian
- Charles Robert Townes m. Emily Quintal
  - b. 1900 Victor Gustaf Hunn Nobbs (9)
  - 1904 Julia Esther Harriet (109)
  - 1908 William Hadley Freemantle (75)
  - 1913 Ilma Louisa Ruth (89)
  - 1916 Elsie Daisy Kathleen (94)

ALBERT VICTOR BATAILLE (French)
m.
SEABURY ELIZA ADAMS

- b. 1880 Louis Victor (41)
- b. 1879 Estelle Helena (137)

HENRY MENZIES (American of German ancestry)
m.
NANCY JANE CHRISTIAN

- b. 1890 Nathaniel Satterfield (22)
- b. 1900 Ethel (114)
- b. 1905 Stephen (1)

GEORGE BAILEY (Devonshire, England)
m.
EMILY WELLESLEY CHRISTIAN

- b. 1877 Gilbert, Edwin (45)

JOSEPH WALTER JENKINS, (New Zealand)
m.
RUTH QUINTAL

- b. 1906 John Lumpkin (79)

FRED. WHITTLE (Australia)
m.
ELIZABETH EVANS

- b. 1910 Agnes Mary (87)

PARDON SNELL (Little Compton, Connecticut)
m.
MARY McCOY

- Isaac m. Mary Adams
  - b. 1906 Celia (105)

FREDERICK WALTER DUFTY (English)
m.
GEORGINA PHYLLIS ADAMS

- b. 1889 Ethel Florrie Claire (125)

ALBERT JAMES LOCKE (New Zealand)
m.
CATHERINE YOUNG

- b. 1897 Mary Catherine (117)

FREDERICK YAGER (JAEGER) (Missouri)
m.
HELEN QUINTAL

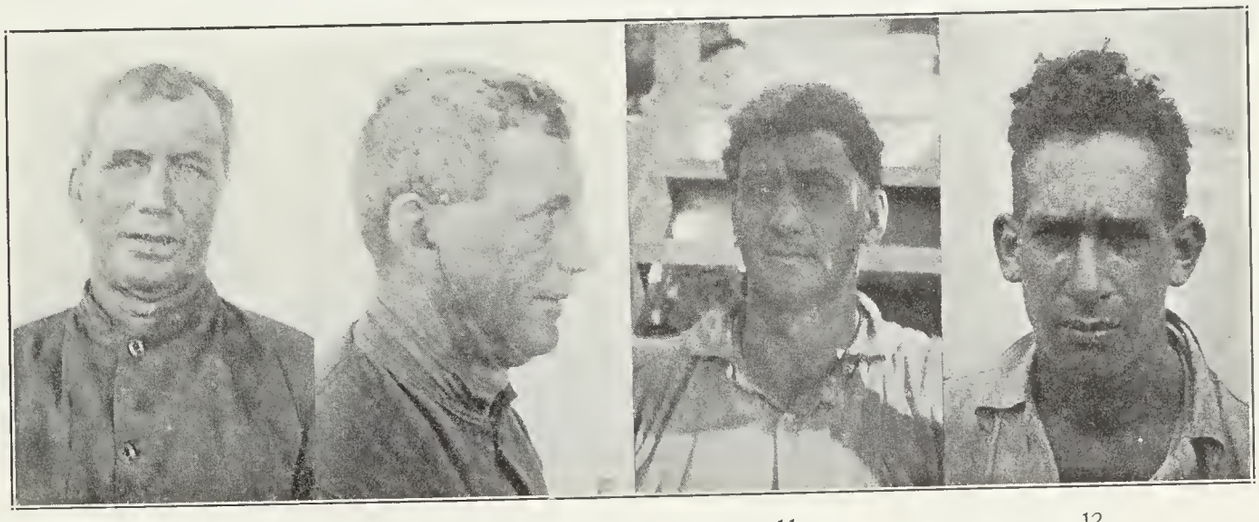
- Rose
- b. 1891 John Thornton (21)

JOHN MILLS
m.
BALHADI (?) (Tahitian)

- b. 1792 Elizabeth
- b. 1794-9 John (n. i.) d. 1814

1 2 3 4

5 6 7 8



9 10 11 12

NORFOLK ISLAND MALES: NUMBERS 1-2, 3-4, AND 5 ARE BROTHERS; NUMBERS 6-7 AND 8 ARE ALSO BROTHERS. THE FATHERS OF THESE TWO SETS OF BROTHERS WERE BROTHERS, THE MOTHER OF NUMBERS 6-7 AND 8 IS AN ENGLISH WOMAN.

1 2 3 4

5 6 7 8

9 10 11 12

NORFOLK ISLAND MALES.

1 2 3 4 5

6 7 8 9 10

11 12 13 14 15

NORFOLK ISLAND FEMALES: NUMBERS 8-9, 13-14, AND 15 ARE SISTERS.

GROWTH OF CHILDREN IN HAWAII; BASED ON OBSERVATIONS BY LOUIS R. SULLIVAN

By Clark Wissler

Memoirs of the Bernice P. Bishop Museum
Volume XI, Number 2

Bayard Dominick Expedition
Publication Number 17

HONOLULU, HAWAII
Published by the Museum
1930

CONTENTS

PAGE

Introduction 109
History of the research 109
Source of data 111
Anthropometric characters recorded 111
Race classifications 112
Measurements 114
Weight 114
Stature 116
Comparative Data 118
Hawaiian crosses 119
Absolute and Relative Span 120
Mixed groups 121
Sitting Height 121
Relative Sitting Height 122
Correlations 122
Head length 122
Hawaiian crosses 122
Width of Head 122
Correlation and Age in Head Diameters 123
The Cephalic Index 124
Race differences in fall of cephalic index 126
Relative age changes in high and low cephalic indices 127
Sex differences in age changes 127
The pre-school period 127
Minimum frontal 128
Face width 128
Zygomatico-Frontal index 129
Bigonial width 129
Zygomatico-Mandibular index 129
Face height 130

PAGE

Anatomical face index 130
Transverse cephalo-facial index 130
Transverse fronto-parietal index 130
Nose height 131
Nose width 131
Nasal index 131
Ear height 131
Ear width 132
Ear index 132
Qualitative characters 213
Hair form 213
Hair color 213
Hair texture 214
Eye color 214
Epicanthic fold 214
Sclera 215
Nasal profile 216
Nose bridge 216
Septum 216
Axis of nostrils 216
Slope of the forehead 216
Glabella 217
Lips 217
Prognathism 217
Chin 217
Roll of the helix 218
Ear lobe 218
Darwin's point 218
Crura 218
Summary 218
Literature Cited 257

GROWTH OF CHILDREN IN HAWAII; BASED ON OBSERVATIONS BY LOUIS R. SULLIVAN

By Clark Wissler

INTRODUCTION

The data herein reported were gathered in the Hawaiian islands by the late Dr. L. R. Sullivan in 1920-1921 under the auspices of the Bernice P. Bishop Museum and The American Museum of Natural History, jointly. Upon his return to New York, Dr. Sullivan classified the observation blanks, and began the tabulation of the data, but before making much progress his health failed, so that he could do little more than continue to give directions for the completion of these seriations. His untimely death leaving even this task far from complete, the responsibility for it has been assumed by me. It seemed best to carry the investigation through according to Dr. Sullivan's plan and to present the results in a form approximating his intentions.

As no text was prepared by Dr. Sullivan, it fell to me to assemble the tabulations in a form suitable for publication and to write the accompanying descriptive and comparative statements. A few references to the available literature have been added, but no exhaustive review has been attempted, the primary purpose of this publication being to put on record the observations made.

HISTORY OF THE RESEARCH

Because of my unusual relation to this investigation, it seems best to give a full statement as to its history. The Hawaiian islands with their heterogeneous racial population have long been considered the ideal place for the study of race groups, both pure and mixed. So, when in the latter part of 1919, H. E. Gregory, Director of the Bernice P. Bishop Museum in Honolulu, discussed with me the plans of the Bayard Dominick Expeditions of that Museum, it appeared an auspicious time to inaugurate work in Hawaii, in conjunction with these expeditions. Accordingly, a plan for cooperation between the Bernice P. Bishop Museum and the American Museum of Natural History was outlined and approved by the Trustees of both institutions.

Since the major problem of the Bayard Dominick Expeditions was a study of the origin and migrations of the Polynesian peoples, it was assumed that an anthropometric and somatic survey of the Hawaiians as one phase of the investigation, would have an important bearing upon the Polynesian problem in its entirety. With this as the basic idea of the cooperative plan, the American Museum assigned the late Dr. Louis R. Sullivan to the Hawaiian islands as its representative to carry on the anthropometric work. In order that Dr. Sullivan might have an official status in the Bernice P. Bishop Museum, he was appointed Research Associate in Anthropology for the eighteen-month period, April, 1920, to August, 1921.

One of the first tasks confronting Sullivan upon his arrival in the islands was training the field-workers of the Bayard Dominick Expeditions in anthropometric technique. Thus the members of the expeditions to Samoa, Tonga, and the Marquesas were outfitted with the essential instruments, and given as much instruction as the shortness of time permitted in the methods of measuring the living and describing their physical characters. Later, when these physical anthropological data were returned by the field investigators, they were analyzed by Sullivan and the results of his studies published by the Bernice P. Bishop Museum (41, 45, 46)[1] thus giving him the basis for a broad view of the Polynesian problem from the physical and anatomical point of view.

The interest of the American Museum was chiefly in the various pure race groups and their intermixtures living in Hawaii. Therefore, the first step in carrying out the plans formulated was to inaugurate a comprehensive anthropometric investigation of the Hawaiians, both of the living population and of the skeletal remains available in museum collections, since the great

[1] Numbers in parentheses refer to Literature Cited (p. 257).

amount of race mixture which has taken place in historic times makes it particularly difficult to decide what were the probable physical characteristics of the prehistoric Hawaiians.

Director Gregory provided for the organization and equipment of an anthropometric laboratory. The examination and cataloguing of the osteological collections on hand was carried on intermittently during Sullivan's sojourn in the islands. Later, the data thus accumulated were supplemented by an examination of the Hawaiian skeletal material in the Peabody Museum of Harvard University and in the American Museum. Unfortunately, the analysis of these original data, together with a large amount of comparative material, gathered with the expectation of pursuing a detailed study of the racial affiliations of the Hawaiians, remains incomplete and uncoordinated.

The investigation of the living Hawaiians necessitated, first of all, the examination of as many individuals of pure stock as could be located. About one thousand pure Hawaiian adults were examined in the islands of Lanai, Hawaii, Molokai, Maui, Kauai, and Oahu. In addition, it was believed that the results of studying individuals of mixed races with known family histories would be especially valuable in arriving at conclusions as to the probable amount and kind of prehistoric mixture that had taken place in this and other Polynesian groups; so approximately two thousand mixed Hawaiian individuals were examined.

Finally, it was felt that the best approach to a race investigation was through the school population of Honolulu, where may be found representatives of several pure race groups, as well as mixtures of one, two, or three races. So it was decided that an investigation of racial differences in growth, as shown in the school population of Honolulu, be made a part of the cooperative plan. Thus about nine thousand children were examined, ranging in age from 5 to 19, representing the following groups: Hawaiian, Chinese, Japanese, North European, South European, Korean, Filipino, Hawaiian-Asiatic, Hawaiian-North European, Hawaiian-South European, and Hawaiian-Asiatic-European.

Tabular data are given for all of these groups, excepting the Filipino, for which group the numbers were too small for statistical treatment.

The work of gathering the data extended over a period of a year and a half, and though in itself a large task, resulted nevertheless in what may be termed the raw material for the study of the representative race groups in Hawaii. Yet, while still in Honolulu, Sullivan began the basic classification of the records into age, sex, and race groups, together with the calculation of the indices for certain of the physical measurements. These were, however, not completed when Dr. Sullivan returned to New York, and soon thereafter Mrs. Lois Treadwell Ruml was engaged for the statistical work. To her are due the calculations for the adult groups of Hawaiians and Hawaiian mixtures, and the growth series for Hawaiian children.

Dr. Sullivan becoming seriously ill about this time, the statistical work was discontinued, but in 1922 an application was made to the National Research Council for financial assistance to continue the compilations of the data. In 1923 the National Research Council granted financial aid for this purpose through its Committee on Scientific Problems of Human Migration. Thus, the completion of the statistical work upon which this paper is based is due to the generous cooperation of this Committee.

The direction of this statistical work was undertaken by Miss Bella Weitzner, who was assisted by Miss Alvira A. Kirk and Miss Winifred Smeaton. Dr. S. D. Porteus of the University of Hawaii, kindly read the manuscript and made many suggestions.

From certain memoranda left by Dr. Sullivan, it appears that he wished acknowledgment made to the entire public school staff in Honolulu, for their most cordial assistance and encouragement. Mr. Cyril O. Smith permitted him to inaugurate the work among the children of the Royal School. Mr. Smith was also kind enough to introduce Dr. Sullivan and make contacts for him with other school principals. Mr. Edgar Wood, Mr. Charles Baldwin, Mr. W. E. Givens, Mrs. Sophie Overend, Mrs. N. L. D. Fraser, Mr. J. A. Wilson, Mr. Isaac M. Cox, Mr. John K. Kaaha, Mr. E. C. Webster, Mr. E. G. Bartlett, Miss Maude Post, Miss Abbie Newton, Mr. A. F. Griffiths, Mr. Levi C. Howland, Mr. Arthur E. Robinson, Miss Mary P. Winne, Miss Sadie Sterrett, and Mr. Chan Ho Min all helped to make the work in their several schools pleasant and profitable. Finally, in all phases of the work, Dr. Sullivan was assisted by Mrs. Bessie Pathers Sullivan.

SOURCES OF DATA

As previously stated, all the data used in this publication were recorded by Dr. Sullivan himself. All examinations were made in public and private schools and consequently limited to children of school age. However, though it is not clear from Sullivan's notes how many children were measured in schools outside of Honolulu, it is certain that the number of such outsiders is small. He endeavored to avoid selection and so to obtain random samples. The relation the number measured by Sullivan bears to the total school population of Hawaii, as shown by the census of 1919 (10) is as follows:

	Public Schools	Private Schools	Total	No. Measured
Hawaiian	3177	623	3800	549
Chinese	3465	1026	4491	1518
Japanese	16295	1251	17546	2139
Korean	446	174	620	231
N. European	1113	1162	2275	847
S. European	6681	1368	8049	1028
Miscellaneous	1048	144	1292	(Discarded)
Part Hawaiian	3940	1421	5361	2328
Total	36165	7169	43271	8640

In 1920, Honolulu reported 13,944 children in public schools and 5,330 in private schools. Practically all of these children were born in Hawaii and all of these schools contain both boys and girls. Both public and private schools are represented in the measurements. Using Sullivan's terminology, the racial distribution in both private and public schools in Honolulu for 1920 was:

	Public Schools	Private Schools	Total
Hawaiian	1,111	322	1,433
Chinese	2,649	933	3,582
Japanese	4,842	760	5,602
Korean	209	184	383
N. European	654	1,231	1,885
S. European	2,190	559	2,749
Miscellaneous	252	87	339
Part Hawaiian	2,037	1,254	3,291
Total	13,944	5,330	19,274

ANTHROPOMETRIC CHARACTERS RECORDED

The anthropometric measurements and qualitative characters recorded and dealt with in this volume are as follows:

1. Weight: taken with Toledo scales.
2. Stature: recorded to the nearest centimeter (shoes removed, or correction made for heel).
3. Span: maximum.
4. Head length: glabella to opisthocranium.
5. Head width: maximum.
6. Minimum frontal diameter.
7. Maximum face width: bizygomatic.
8. Bigonial diameter at the angles of the mandibles avoiding as much of the muscles as possible.
9. Anatomical face height: nasion to gnathion.
10. Nasal height: nasion to subnasale.
11. Nasal width: alare to alare, avoiding pressure.
12. Physiognomic ear length or height.
13. Physiognomic ear breadth.

INDICES

14. Relative Span = $\frac{\text{Measurement No. 3} \times 100}{\text{Measurement No. 2}}$
15. Cephalic Index = $\frac{\text{Measurement No. 5} \times 100}{\text{Measurement No. 4}}$
16. Transverse fronto-parietal index = $\frac{\text{Measurement No. 6} \times 100}{\text{Measurement No. 5}}$
17. Transverse cephalo-facial index = $\frac{\text{Measurement No. 7} \times 100}{\text{Measurement No. 5}}$
18. Zygomatico-frontal index = $\frac{\text{Measurement No. 6} \times 100}{\text{Measurement No. 7}}$
19. Zygomatico-mandibular index = $\frac{\text{Measurement No. 8} \times 100}{\text{Measurement No. 7}}$
20. Anatomical facial index = $\frac{\text{Measurement No. 9} \times 100}{\text{Measurement No. 7}}$
21. Nasal index = $\frac{\text{Measurement No. 11} \times 100}{\text{Measurement No. 10}}$
22. Physiognomic ear index = $\frac{\text{Measurement No. 13} \times 100}{\text{Measurement No. 12}}$

QUALITATIVE CHARACTERS

The descriptive or qualitative characters include: skin color, hair form, hair texture, hair color, eye color, eyefold, nose bridge, nasal profile, axis of nostrils, septum, forehead, glabella, lips, prognathism, chin, ears, Darwin's point, crura.

The specific modes of procedure in making these observations were based upon Martin (21) and Sullivan (43).

Hair was classified, according to form, as straight, low waved, deep waved, curly, frizzly, woolly; according to texture, as coarse, medium, fine; according to color, as black, dark brown, reddish brown, light brown, blond, golden, red, gray.

Eye color was described as black, dark brown, light brown, blue, gray, blue-brown, gray-brown. The condition of the sclera was recorded as clear, speckled, yellow, dull, bloodshot; however, in the tabulations this terminology has been reduced to two classes: clear and unclear. The Mongoloid or epicanthic eyefold was described as absent, trace, medium, or marked.

The plan was to record the color of the skin of the inner side of the arm, for unexposed skin, and the cheek for exposed skin. However, upon examination of the records it appears that skin color was taken in sporadic cases only and so infrequently as to render tabulation useless.

The nostrils were classified according to the direction of their long axis: anterior-posterior, oblique, transverse. The classification of the septum of the nose was wide, medium, narrow, exposed, level, hidden.

The slope of the forehead was recorded as vertical, moderate slope, or low. The degree of development of the glabella was described as smooth, medium, or prominent.

Three classifications were given to thickness of the lips: thin, medium, and thick.

Prognathism was noted as none, medium, and marked, and the type of chin described as prominent, medium, receding.

The development of the ear lobe was recorded as none, small separate, small attached, large separate, large attached; the roll of the helix, as flat, rolled through first third; rolled through second third; rolled through entire ear. Darwin's point on the ear was described as present or absent. The crura was described as high, medium, or low.

RACE CLASSIFICATIONS

The groupings used here were made by Dr. Sullivan and the original sort of the blanks checked by him. As he left no statement concerning these classifications, I can do no more than state what the records themselves reveal. According to these, there are six race groups: Hawaiian, Chinese, Japanese, North European, South European, and Korean. All so designated were considered of unmixed descent. Under North European were placed all white children, claiming ancestry from the United States (Old American) or some North European country, as England, Germany, Sweden. The South European classification covers all children claiming ancestry in South European countries, as Portugal, Spain, Italy, and in addition Americans of Spanish descent.

The mixed children were classified as Hawaiian-Asiatic, Hawaiian-North European, Hawaiian-South European, and Hawaiian-Asiatic-European. The constituency of these mixed groups is as follows:

Hawaiian-Asiatic=Hawaiian mixed with Chinese and occasionally a Korean.

Hawaiian-North European=Hawaiian mixed with American, German, Swedish, English, Irish, Scotch, or German.

Hawaiian-South European=Hawaiian mixed with Portuguese, Spanish, Italian, Porto Rican (white), or Mexican (white).

Hawaiian-Asiatic-European=Hawaiian mixed with Chinese or Korean, and white, either American or European.

In all the mixed groups no attempt has been made to classify according to the degree of mixture, so that each age or sex group consists of individuals of varying degrees of mixture.

A few Filipino children were examined, but the number was too small for statistical treatment.

In accordance with Sullivan's directions, the age grouping of the record blanks was by the last birthday; hence, the mean ages for the successive age groups are to be read on the half year, as 9.5, 10.5, etc.

Dr. Sullivan intended to make a special study of growth among the crosses, after sufficient additional data had been collected. As he was not able to go on with this, it seems best to compile the data available, and to give the gross group averages, leaving the analysis of the groups to the future.

In the meantime a special study of adult Hawaiian crosses has been published by Dunn (13, 14). It is true that some individuals of school age were included in this study, but as the objective of the investigator was the position of the adult cross, no direct comparisons can be made.

As stated previously, the crosses tabulated fall under the heads: Hawaiian-Asiatic, Hawaiian-North European, Hawaiian-South European, and Hawaiian-Asiatic-European. In the data collected are scattering crosses with Filipinos, other Polynesians, American Indians, American Negro, etc., but none of these groups was large enough to be statistically useful. The components of the tabulated groups are given in Table I. Sullivan carefully considered the evidence of parentage of each individual,—though his data rarely included the grandparents,—and made the estimate of mixture. However, in the compilation of these tables the original data have been checked.

In genetic terms the half castes are F_1 generation. This classification probably possesses greater certainty than the others. Under the 2/4 rating were placed those appearing to be F_2. While this grouping may not be so accurate as that for F_1, it has apparently a high reliability. The remaining groups are all back-crosses. Although a separate table for the three-strain group, Hawaiian-Asiatic-European, has not been prepared, the following total summary will give the picture in general, as respects the amount of Hawaiian blood entering into the group of males:

Hawaiian ¼	45 per cent
Hawaiian ½	43 per cent
Hawaiian ¾	5 per cent

TABLE 1. COMPONENTS OF HAWAIIAN CROSSES

Ages 6 to 19 Years

Hawaiian-Asiatics

	Hawaiian ½ Chinese ½	Hawaiian 2/4 Chinese 2/4	Hawaiian ¼ Chinese ¾	Hawaiian ¾ Chinese ¼	Miscellaneous and Doubtful Chinese Mixtures	Miscellaneous Hawaiian-Asiatics
Male	75	36	63	84	68	28
Female	94	28	44	123	91	22

Hawaiian-North Europeans

	Hawaiian ½ N. European ½	Hawaiian 2/4 N. European 2/4	Hawaiian ¾ N. European ¼	Hawaiian ¼ N. European ¾	Miscellaneous Hawaiian-N. European
Male	101	89	121	101	69
Female	100	133	122	101	95

Hawaiian-South Europeans

	Hawaiian ½ S. European ½	Hawaiian 2/4 S. European 2/4	Hawaiian ¾ S. European ¼	Hawaiian ¼ S. European ¾	Miscellaneous Hawaiian-S. European
Male	68	18	40	24	20
Female	65	18	43	27	19

MEASUREMENTS

Observations are presented under two main heads, measurements and qualitative determinations. In the first, each bodily measurement is taken up separately, thus, under weight will be found tabulations by age and sex for each race group. This arrangement facilitates comparison of race groups, the chief objective in this study. Similar studies were made on Hawaiian adults and their various crosses, but no such data are available for the adults of other race groups.

The averages and variabilities, as given in the tables, were calculated in the usual way. The significance of the headings used in these tables is as follows:

No.=the number of individuals
A.=the average
Sd.=the standard deviation
V.=the standard deviation divided by the average, or, the coefficient of variation in decimal terms. These can be read as percentages, if desired.
Em.=the deviation of the average, or the standard deviation divided by the square root of the number of individuals.

To facilitate the comparative study of the race and sex groups, the increments of growth were calculated by taking the differences between the averages for the successive years and these differences were tabulated for each measurement. To save space, these have been omitted; in any event, they can be calculated from the published tables. Also smoothed series for the means and increments have been calculated, for most of the measurements, but though reference is made to them in the text, these additional tabulations have been omitted. They, also, can be calculated from the data given.

Age changes among children are progressive and, it is assumed, conform to a type curve for the group. The samples used here, therefore, may be expected to approximate this curve, while the smoothed series indicates the form of this type curve. For study purposes, each age series was plotted and the resulting graphs used in comparing and analyzing the growth in each character measured. Thin tracing paper was used to superpose the graphs to be compared. In this way it was possible, by inspection, to determine the relative magnitudes of each group, compare the various fluctuations, and discriminate between those recurring from group to group as against the mere accidental fluctuations. The printing of these graphs seems unnecessary, since any particular graph needed for comparative study can be quickly plotted from the tables. Many of the differences were checked by the usual method of estimating the certainty of group differences, but these also are obtainable from the tables. It should be noted, however, that the comparative statements in the text are based upon a comparison of the growth curves.

WEIGHT

In schools where scales were available, the weight of children was recorded in pounds, the yearly averages for which will be found in the accompanying tables.[2] A general survey of the data shows that from about the ninth year to the fourteenth, girls are heavier than boys; after that, the positions are reversed. The differences between the older boys and girls seem greatest for European children and least for Hawaiians.

In size, Chinese and Japanese children are about the same until the age of twelve, when the Chinese forge ahead slightly, but in later years Japanese girls lead Chinese girls. Probably there is little real difference between these groups. The Koreans weighed seem heavier than either.[3]

The Hawaiians are much heavier than the Chinese, even at five years of age. They are also markedly heavier than the North Europeans, though, as will be noted later, not so tall. The South Europeans are not so heavy as the North Europeans, the relative weights, at sixteen years of age, are shown by the following:

TABLE II. COMPARATIVE WEIGHT AT SIXTEEN BY RACES

	Male	Female
Hawaiian	139	125
North European	131	120
Korean	119	103
South European	110	108
Japanese	108	103
Chinese	107	100

Since the curves for increase in weight are of interest to educators and those concerned with

[2]Murdoch and Sullivan (47) used 580 cases from the North European series, giving a table for weight and stature. Their averages differ slightly from Table 3, which includes additional cases.

[3]A table by Miss Harriet Stone (29) is based on height and weight data for more than 20,000 school children. The tabulation is not in a form to compare with Sullivan's data, but the measurements are on file in the Nutrition Bureau, Honolulu, and cover all the race groups in Hawaii.

children's health, smoothed curves for all the pure race groups except the Korean have been prepared (fig. 1). The smoothed means upon which these curves are based are presented in Table III. The curves present certain differences, but these may be exaggerated by unequal accuracy in the ages given. It appears, however, that Japanese, Hawaiians, and North Europeans closely agree as to this period. If the South Europeans over-stated the ages of their children, the later period of sex reversal shown in the curve would be explicable, but the very early period for the Chinese could not be so explained. Further, Stevenson's data (40) for Central Chinese children agree fairly well with this curve.

If smoothed graphs for the increments in weight are drawn, some differences in period of acceleration appear. Thus, the graphs for boys will cross those for girls in the two European groups at thirteen to fourteen, but for the Hawaiians, Japanese, and Chinese, at twelve to thirteen.

In stature, there is a marked sex difference in the range of variability among Hawaiian children, the peak for girls appearing at an early age. This same phenomenon is observable in weight and so cannot be explained as an error of measurement.

In comparison with children of Worcester (U. S.) the weights of North European children in Hawaii are about the same, except that the older children of Hawaii tend to be heavier.

The published data on Chinese children by Stevenson (40) show that the sex graphs for weight cross at twelve to thirteen for South and Central Chinese, but at fourteen to fifteen for North Chinese. The North Chinese lead in weight after eleven (girls) and fifteen (boys), respectively. In fact, it is not until these ages are reached that these groups diverge. Compared with the data here presented, it appears that the weights for North Chinese in China are about the same as for Chinese in Hawaii.

Some additional data on children in China may be noted: Crook (12) gives a series for boys from

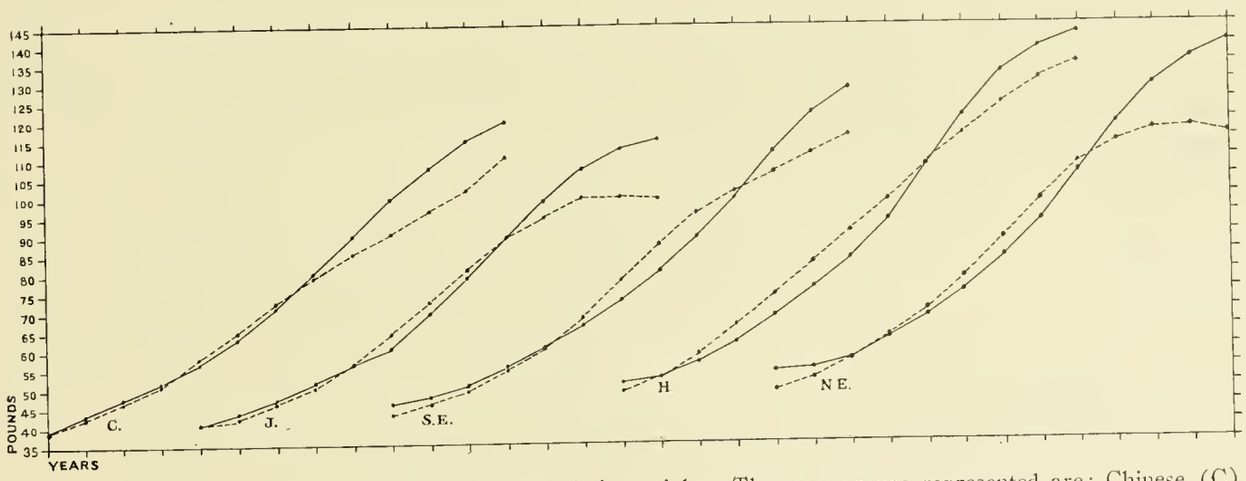


FIGURE 1.—Graph showing comparative growth in weight. The race groups represented are: Chinese (C), Japanese (J), South European (S.E.), Hawaiian (H), and North European (N.E.). Each curve covers the period from six to eighteen years; the dots represent the smoothed averages for the successive years. Males are indicated by continuous lines, females by broken lines.

TABLE III. SMOOTHED AVERAGES FOR WEIGHT

Male

Age	Hawaiian	Chinese	Japanese	North European	South European
6.5	50.7	40.0	41.9	53.8	46.0
7.5	52.6	43.2	44.0	54.6	47.7
8.5	56.4	47.3	47.5	57.1	51.0
9.5	61.8	51.6	51.5	62.1	55.4
10.5	68.4	56.7	56.1	67.9	60.6
11.5	76.6	62.7	61.6	74.9	66.1
12.5	84.1	70.3	69.1	82.9	72.8
13.5	94.1	79.4	78.4	93.0	80.3
14.5	107.3	89.1	88.8	105.5	89.3
15.5	120.6	98.5	98.9	118.4	99.0
16.5	132.0	106.9	107.1	128.5	111.0
17.5	138.6	114.1	112.5	135.7	121.9
18.5	142.2	118.9	114.8	139.9	128.0

Female

Age	Hawaiian	Chinese	Japanese	North European	South European
6.5	48.7	39.5	41.1	48.4	43.6
7.5	52.7	42.5	42.9	52.0	45.9
8.5	58.9	46.4	46.3	57.1	49.9
9.5	66.3	51.2	50.9	63.0	55.1
10.5	74.1	57.1	56.9	69.7	61.5
11.5	82.5	64.1	64.2	78.0	69.2
12.5	90.9	71.8	72.7	88.1	78.5
13.5	98.6	78.5	81.0	99.0	87.6
14.5	106.9	84.8	88.8	107.7	95.6
15.5	115.4	89.9	94.8	113.3	101.1
16.5	123.8	95.8	98.9	116.1	105.6
17.5	130.3	100.6	100.1	117.0	110.8
18.5	134.2	109.2	99.7	115.7	115.9

ten to twenty-three years old, presumably weighed in Hongkong; below fourteen years his annual averages are appreciably higher than ours, but after that point they are lower. Shirokogoroff and Appleton (38) publish a weight table for Chinese girls and boys in Chekiang and adjoining provinces, all of whom are much lighter than those in the series given here. Baldwin (3, pp. 306, 317) compiles tables for male and female Chinese children. The number of cases is not large. For Japan, Stevenson (40) gives weights for Japanese boys and girls as lower than in these series.

Measurements and qualitative data for Korea are given by Kubo (20, p. 79) based upon soldiers and prostitutes. The ages range upward from fourteen years. He states "that the Korean girls are lighter than the Japanese, whereas the boys are heavier."

As always, the interesting question is the weight of the crosses. For example, the Hawaiian-Asiatic cross falls between the heaviest and the lightest stock. The result is the same as for stature, the crosses standing midway between. However, in variability the crosses are a little higher than the parent stocks; but in periods of acceleration in growth, they are intermediate.

The differences between North Europeans and Hawaiians are relatively small; consequently, it is not clear that the crosses are intermediate, though seemingly they average about the same as the parent stocks. The South European cross seems to weigh less than the North European and is clearly intermediate to the parent stocks. Finally, the Hawaiian-Asiatic-European group appears to be intermediate between the constituent crosses.

Comparing the sexes by weight, it appears that boys and girls reverse in lead at about the fifteenth year, which is a little later than for the corresponding shift among full-bloods. On the other hand, when increments alone are taken, the change of lead occurs at the same ages as for full-bloods.

STATURE

The gross statures, without shoes, are given for ages six to nineteen, by race and sex. The number of cases is small, but in this respect the groups are comparable. The main interest here, however, is in the form of the growth curve; for example, approximately around the fourteenth year, in each race group, whether mixed or pure, the curve for boys crosses above that for girls. Previous to this, or approximately from ten to thirteen years, girls tend to lead boys in stature; after fourteen years, the reverse is true. As this phenomenon has been observed in previous investigations, mostly with white children, I am encouraged to believe that the number of cases available in this study is sufficient for general conclusions. There is reason to expect small differences in races with respect to the time of this sex reversal in stature, but the data here are scarcely adequate for such refined comparisons.

Smoothed means and growth curves have been prepared (fig. 2), which are closely parallel to those for weight and need no special comment.

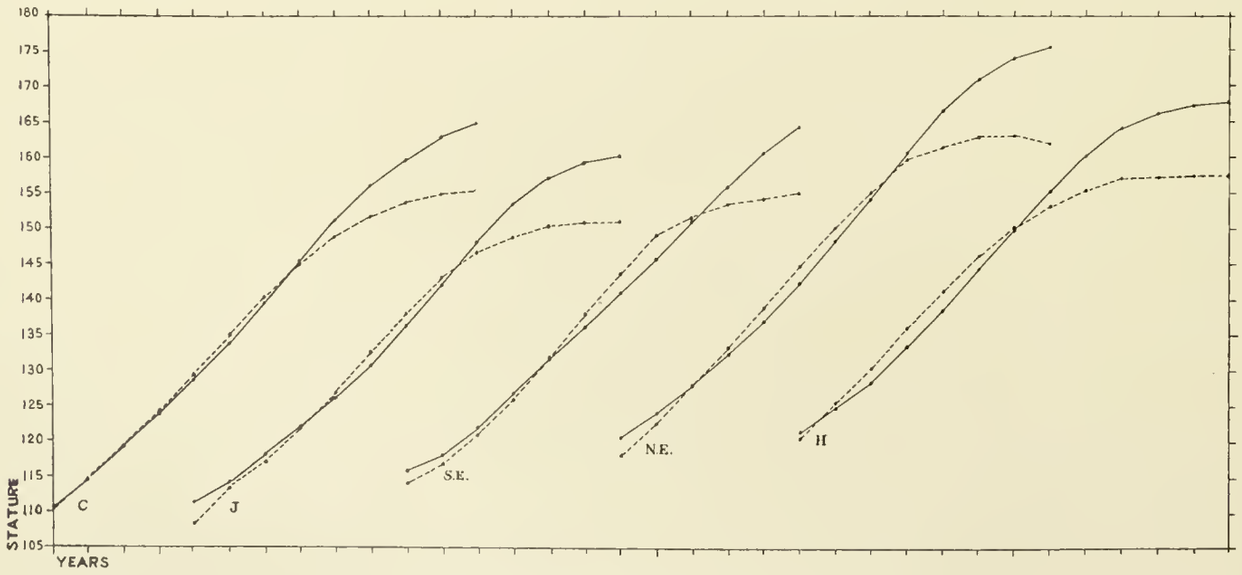


FIGURE 2.—Graph showing growth in stature. The race groups represented are: Chinese (C), Japanese (J), South European (S. E.), North European (N. E), and Hawaiian (H). Each curve covers the period from six to eighteen years; the dots represent the smoothed averages for the successive years. Males are indicated by continuous lines, females by broken lines.

The Chinese again show the earliest period for the acceleration of growth for boys and the South Europeans show a relatively late period.

TABLE IV. SMOOTHED AVERAGES FOR STATURE

Male

Age	Hawaiian	Chinese	Japanese	North European	South European
6.5	119.0	110.7	111.4	120.9	115.7
7.5	121.0	114.6	114.3	123.7	117.9
8.5	124.5	119.3	118.1	127.7	121.8
9.5	128.1	123.9	122.2	132.2	126.6
10.5	133.2	128.7	126.3	136.8	131.4
11.5	138.2	133.7	130.8	142.2	136.0
12.5	144.2	139.5	136.2	148.0	140.6
13.5	149.6	145.5	142.3	154.3	145.5
14.5	155.0	151.2	148.4	160.8	150.8
15.5	160.3	156.1	153.6	166.5	155.8
16.5	164.1	159.8	157.2	171.2	160.4
17.5	166.3	162.8	159.3	174.2	164.1
18.5	167.2	164.8	160.0	175.4	166.3

Female

Age	Hawaiian	Chinese	Japanese	North European	South European
6.5	120.3	110.3	108.2	117.8	114.0
7.5	125.1	114.7	112.7	122.4	116.6
8.5	130.3	119.5	117.4	127.7	121.0
9.5	135.6	124.4	122.2	133.1	126.0
10.5	140.9	129.5	127.3	138.8	131.5
11.5	145.7	135.1	132.8	144.6	137.2
12.5	149.7	140.4	138.4	150.0	143.0
13.5	152.9	145.2	143.2	154.9	147.9
14.5	155.2	148.9	146.8	158.6	151.4
15.5	156.7	151.6	148.9	161.4	153.0
16.5	157.1	153.1	150.2	162.8	153.9
17.5	157.3	153.9	150.7	163.1	154.9
18.5	157.3	154.1	150.9	162.1	156.5

As to the increments, or the rates of growth, the result is about the same as above, except that where the Hawaiians, Japanese, Koreans, and North Europeans show the crossing of sex curves at approximately thirteen years, the Chinese cross at twelve and the South Europeans at fourteen. With the mixed groups, the points are, Hawaiian-Asiatic and North Europeans, 12.5; Hawaiian-Asiatic-European and South European, 13.0. Some of these differences can be taken as approximating certainty. Altogether, the above would place the puberal acceleration for girls at or before twelve, for boys, at or after thirteen.

A detailed comparison of the several race groups, noting males only, shows that the North European boys are taller throughout. Their lead increases, absolutely, with age, so with respect to actual increment, they are clearly ahead. The Japanese hold the other extreme, being uniformly shorter, and, in the end, tend to fall further behind. This seems to imply a shorter growing period for the Japanese. The Chinese parallel the Japanese, though they are invariably taller and show a more prolonged growth at the end. The Hawaiians are interesting, at the outset falling just below the North Europeans, but lagging after the tenth year, falling back more and more, until they stand about halfway between the Chinese and North Europeans. A relative declining rate of growth after ten years is indicated, or, they seem to cease growing at about sixteen to seventeen, as against eighteen to nineteen for the Europeans. Finally, the South Europeans stand between the Chinese and the Hawaiians.

The graphs for females serve as a check and confirm these statements, except that the Hawaiian girls tend to lead the North European girls up to eleven years.

Mr. Isaac M. Cox (11) recently measured and weighed some 400 Hawaiian girls, attending the Kalihiwaena School, Honolulu, and concludes that:

> Hawaiian girls grow after a very different fashion. These not only outstrip Hawaiian boys in every respect of growth but the earlier and quicker acceleration brings the crossing point forward. Whereas in American girls the height-to-weight average line crossed above that for boys between 12 and 13 years and advances but slightly above that line, in the case of Hawaiian girls the boys are outstripped in every respect at 9 years, in height, in weight, and in the height-to-weight ratio. This is not only interesting, it may be of very great significance to *haole* teachers of Hawaiian girls.

A study of some 388 Honolulu Chinese boys and about as many girls was made by Doctor Appleton in 1924, probably measuring some of the same individuals used in the tables here presented. The author published the tables for boys only, the average as given running closely parallel to those in our tabulations. According to this author the Chinese in Hawaii are chiefly the descendants of immigrants from Kwantung Province, South China (2).

In previous studies of growth it has been noted that an increased variability marks periods of accelerated growth. It may happen, then, that variability will the more clearly reveal the time of growth changes and rhythms. The coefficient of variation in the tables makes it clear that the degree of variation tends to rise from six years to thirteen or fourteen, after which there is a sharp decline; especially is this true of boys: Hawaiian, Chinese, Japanese, North European. There are even hints of two minor peaks, one before eight years and the other at ten.

Girls, on the other hand, show less uniformity: the drop for North European girls comes after fourteen; for Chinese and Japanese after eleven;

and for Hawaiians, after ten years. The last may be obscured by accident, for like Hawaiian boys, the girls reach a low point at eleven and then react, only to fall rapidly and steadily. It has been noted in studies of white children, that the females tend to be more variable in growth rates.

In general, then, the coefficient of variation gives a picture of growth rate periods, in clearer detail than by the usual method of comparing averages. One of the striking sex differences shown here is that the boys for four race groups accelerate uniformly, whereas the girls show wide group divergencies.

Comparative Data

Japanese norms, as reviewed by Baldwin (3, pp. 275, 289) seem to indicate that Japanese children in Hawaii are slightly taller than those in Japan. Stevenson finds Japanese boys and girls all shorter than those in the series given here (40). This may be due to selection, in that tall parents tend to emigrate. Data for Japan (Miwa), quoted by Kubo (20, pp. 96, 110) indicate that Japanese boys in Hawaii are taller than those in Japan, while the girls are shorter until twelve to thirteen years and then taller. Some of these differences may be due to age inaccuracies. For Korea, girls over fifteen years are shorter than in Hawaii and boys taller, but these are selected classes. In a brief note by Misawa (23) are reported data on height and weight compiled from publications in Japanese. A general table is given as based upon 869,014 cases gathered by the Department of Education. The averages in these tables for both boys and girls are clearly lower than in the data from Hawaii. However, a special series of measurements made by Mishima, presumably at a later date, gives higher averages, from which the author concludes that Japanese children are growing taller. However, these later averages are still lower than those for Hawaii. Finally, Kanzaki (19) presents graphs for stature and weight, comparing children in Japan with Japanese children in America, showing the latter to be taller and heavier throughout. The mean stature for the Japanese population is given by Matsumura (22, pp. 79, 83) and, though few adult records for Japanese in Hawaii were made, the averages stand as follows:

	Male	Female
In Japan	161.98	149.92
In Hawaii	161.92	150.92

These values are comparable, but are for adults only. On the other hand, the data for children suggest greater size, or at least more rapid growth for the Japanese in Hawaii. It is possible that the adult Japanese measured in Honolulu were immigrants.

The data for height and weight in North China, Central China, and South China have now been segregated (40). The adults of both sexes vary in order ascendingly, from south to north, but during the growing period, from five to twenty years, change their relative positions. Comparing these results with those for Chinese in Hawaii, it appears that the adult average is less than that for North China, but greater than for either Central China or South China.

Noting the rate of growth (fig. 2), it appears that at the ages from twelve to sixteen, Chinese boys in Hawaii exceed all Chinese boys in stature, or grow faster, but fall behind the North Chinese boys in later years. Before twelve years the rate of growth in Hawaii is slower than for the North Chinese.

Chinese females in Hawaii, eleven to sixteen years, are intermediate, but before eleven their growth rate is slowest of all. These differences in growth rate are interesting and, so far, not adequately explained.

Appleton (1) published some data on Chinese females (Chekiang). Her measurements were mostly on the body; those comparable to Sullivan's data being weight, stature, sitting height, and length and breadth of head. Only a small number of children were measured by Appleton, but it is apparent that the girls in China, from six to eleven years, are taller than those in Hawaii, but after that age the reverse is true. Stevenson's data show that the rate of growth in North China is greater up to the age of twelve than for Hawaiian Chinese. According to Shirokogoroff's data (36), boys in Chekiang are taller than Hawaiian Chinese until twelve years, after which the Chinese in Hawaii excel. It cannot be said with certainty that these data are comparable to Sullivan's, but it is clear that at least in some parts of China such differences will be found.

Some Chinese prostitutes in Sumatra, ranging from sixteen to twenty-one years observed by Hagen (17) range from year to year about 10 cms. shorter than Chinese in Hawaii. Crook (12) gives statures for boys in Hongkong (?) from ten to twenty-four years.

In a series of Chinese measurements by Pyle (28) the differences between girls and boys are so great that an error is suspected. As it stands, the girls are much shorter than those in the series here presented, while the boys are taller. The same relations hold for sitting height.

The fathers of many North European children represent an early white immigration into Hawaii, and so may be comparable to the New England stock of that time. A comparison with Worcester children (7) shows that the average yearly stature for both boys and girls is approximately the same; until the twelfth year the agreement is surprisingly close. But from thirteen years on, North Europeans of both sexes in Hawaii forge ahead of Worcester children. On the other hand, Worcester children are tall for American children, as tall or taller than Oakland (California) children, who should have tall fathers because of the selection of migration from east to west. According to the same principle, the North Europeans of Hawaii should be tall. The children are taller than English children; taller than those of Sweden; and perhaps a shade taller than those of Norway.

As to place of birth, the records show that 206 boys and 257 girls were born in Hawaii. (See Table V.)

ties of the two groups. The peak in variability for Worcester boys is at fourteen to fifteen years; in Hawaii, at thirteen to fourteen years; for Worcester girls, from twelve to fourteen years; North European girls in Hawaii, eleven to thirteen years. This strongly suggests that the period of accelerated growth comes about one year earlier in Hawaii. The girls in Hawaii come in still earlier than their North European sisters.

Some data on Porto Rican boys may be, in part, comparable to the South European group; the statures given are slightly lower year for year than in the series here presented (39).

On the whole, then, the children of Chinese, Japanese, and North Europeans, are as tall, if not taller, than those of corresponding age in the mother countries.

Hawaiian Crosses

The amount of growth and the relations of the sexes in Hawaiian crosses in absolute and relative growth are about the same as for the pure race groups. The North European crosses, in the matter of absolute sitting height are intermediate, but seem to be nearer the North European level; the same is true for relative sitting height. This is interesting because both the absolute and the

TABLE V. BIRTHPLACES OF NORTH EUROPEAN CHILDREN

Hawaii		California		35 to 38 other States and Territories		Canada		Great Britain		Miscellaneous	
m	f	m	f	m[1]	f[1]	m	f	m	f	m	f
206	257	60	55	129	82	3	8	9	5	6	8

[1] Range for males from 1 to 12 in a single state; range for females from 1 to 7.

The places of birth for the parents of these white children were not recorded in as much detail as for the offspring. The greater number of parents were recorded as American, with an occasional note as to the country of their extraction. A check of the records shows that of the parents of boys, 77 per cent were of foreign birth or foreign extraction, approximately 75 per cent of these coming from England and the British Dominions. The number of parents of girls of other than pure American extraction was somewhat larger, the total being 128. Here again the proportion from England is considerable, 65 per cent. The other countries represented are Germany, Holland, and Sweden.

An important general consideration is the period of acceleration in growth as shown in the variabili-

relative sitting height for the Hawaiians and Chinese are so nearly the same that their crosses cannot be placed, other than to say that they are coincident.

The South European cross is clearly intermediate, both in relative and absolute sitting height. The Hawaiian-Asiatics are but slightly higher than the Hawaiian-North Europeans; the tri-crosses are a little nearer the Hawaiian-Asiatic level, but are still intermediate.

Having established the intermediate position of the Hawaiian crosses, growth periods may be considered. The smoothed curves give no grounds for assuming differences, the age trends for the coefficient of variation among males being about the same for each parental group (p. 137).

TABLE VI. SMOOTHED AVERAGES FOR STATURE

Age	N. European	Hawaiian Crosses	Hawaiian
		Males	
6.5	120.9	118.6	119.0
7.5	123.7	121.8	121.0
8.5	127.7	126.1	124.5
9.5	132.2	130.8	128.1
10.5	136.8	135.4	133.2
11.5	142.2	140.1	138.2
12.5	148.0	145.3	144.2
13.5	154.3	151.0	149.6
14.5	160.8	156.9	155.0
15.5	166.5	162.8	160.3
16.5	171.2	167.3	164.1
17.5	174.2	170.1	166.3
18.5	175.4	170.6	167.2
19.5	174.6	170.4	167.7
20.5	173.4		
		Females	
6.5	117.8	118.5	120.3
7.5	122.4	121.6	125.1
8.5	127.7	126.0	130.3
9.5	133.1	131.1	135.6
10.5	138.8	137.0	140.9
11.5	144.6	142.6	145.7
12.5	150.0	147.9	149.7
13.5	154.9	152.1	152.9
14.5	158.6	155.5	155.2
15.5	161.4	157.6	156.7
16.5	162.8	159.0	157.1
17.5	163.1	159.5	157.3
18.5	162.1	160.4	157.3
19.5	160.6	160.2	
20.5	159.6		

Figure 3 shows the growth period of the mixed

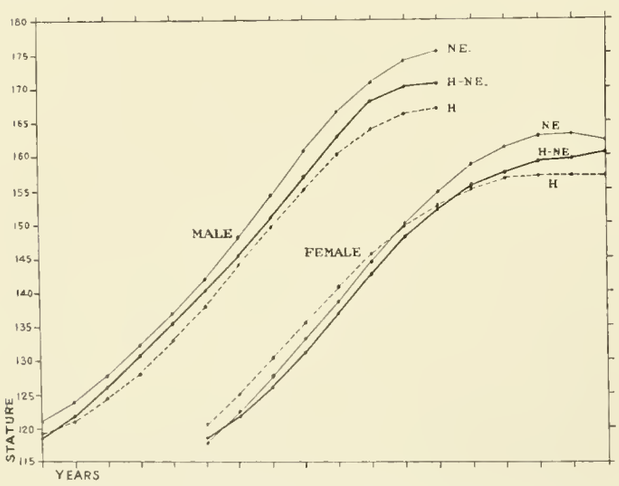


FIGURE 3.—Statures of Hawaiian-North European. The broken lines, Hawaiians (H); and the remaining lines, North Europeans (N. E.). Each line covers the crosses. The heavy lines represent the crosses (H-N.E.); period from six to eighteen years; the dots represent the smooth averages for the successive years.

group to be also similar. However, a marked difference exists between the age trends for females, the peak for Hawaiians is at 8.5, for North European at 14.5; the hybrid girls show the peak at 10.5, or take an intermediate position.

A further examination of the trends for variation will show characteristic types of curve for the respective groups. Thus, while the variability trend for North Europeans in Hawaii resembles that for white children on the continent, there are differences, bringing the white children in Hawaii nearer to the Hawaiians than to other white children, but even so, the differences are distinct enough to be registered in the white crosses.

The differences in stature as between Hawaiians and Chinese are about the same in degree as between North Europeans and Hawaiians, and the averages (Table XI) show again that the cross is uniformly intermediate. The variability trends show the peaks for crosses for boys at 13 to 14, girls at 12.5, which is again intermediate.

The South European crosses are clearly intermediate, but seem a little nearer the Hawaiian than the South European norm. In variability, South European boys show the peak at twelve to thirteen, girls at nine to eleven; the crosses, boys at twelve to thirteen; girls at nine to eleven. In period of accelerated growth, the South European boys and girls are near the Hawaiian standard and so there is little difference in the cross.

In some ways the most interesting of all is the Hawaiian-Asiatic-European group, but the cases are few. The mixtures vary greatly—half the mothers are Hawaiian-Chinese, and one-fourth are Hawaiian-European; the fathers, on the other hand, are about half Hawaiian-European and one-fourth are white (chiefly South European):

	Fathers Per Cent	Mothers Per Cent
European	23	7
Chinese	10	3
Hawaiian	1	5
Hawaiian-Chinese	14	55
Hawaiian-European	47	25
Chinese-European	2	3
Hawaiian-Asiatic-European	3	2

In the measurements it appears that these three-part crosses are consistently intermediate between Hawaiian-Europeans and Hawaiian-Chinese the prevailing parental combinations. The variabilities for these tri-crosses are not appreciably higher than for the hybrids.

ABSOLUTE AND RELATIVE SPAN

The tables for arm reach make possible a relative rating of the several groups. First, in the absolute length of reach, the North European group exceeds the South European, though the difference is not so great but that South European boys over fourteen years exceed North European girls. The Chinese are closely parallel to the South Europeans; the Japanese fall still lower,

their boys over sixteen years are parallel to North European girls, whereas Chinese boys of the same age exceed North European girls. The Koreans are about with the Japanese.

The Hawaiians are nearer the North European standard than any other group, though Hawaiian girls tend to a slightly lower reach than North European girls.

The relation of the sexes is closely similar to that for stature; at six years the boys lead, from ten to thirteen the girls lead. The crossing point for the sex graphs is twelve to thirteen years for the Hawaiians, Chinese, and Koreans; thirteen to fourteen for the Japanese and European groups.

Comparing the variabilities, as in stature, North European girls reach the peak at eleven years, boys at thirteen; Chinese girls at eleven, boys at fourteen. On the other hand, the increments show that the girls lead at twelve to thirteen years for Hawaiian, Japanese, and South European; at eleven to twelve years for Chinese, Korean, and North European.

In relative span, the Hawaiians have the highest index, or, as related to stature, have the longest arm reach. Since they are also heavy for their stature, this suggests a greater shoulder width. The actual length of arm may not be so great relatively. Hawaiian girls show a lower index than boys and this sex difference tends to increase rapidly after fifteen years, which is characteristic of all the race groups. However, the difference between Hawaiian girls and boys seems greater than for any other group. The North European children range with the South European until the eleventh to the twelfth year, but from then on the indices for the South Europeans are higher. Taking the North Europeans as the standard, the Chinese are approximately the same, the Japanese and Koreans are lower, the Hawaiians higher.

In contrast to absolute span, the sexes do not reverse positions, for the males lead, but the sexes diverge more and more with age.

Finally, growth brings an increase in index, ranging from 96 to 99 at six years and from 100 to 105 at eighteen. Compared with other bodily indices, this is a large age change. Nor are periods of growth marked, the increments proceeding with fair uniformity. Nevertheless, the increments show a slight tendency to be highest at twelve to fourteen years. The same might be said for the variabilities, but both are erratic. The data as a whole suggest that growth in relative span is steady.

Mixed Groups

It was noted that absolute span was about the same for Hawaiians and North Europeans; it is also evident that the Hawaiian-North European crosses are the same as the parent stocks. On the other hand, there is a marked difference between the Hawaiians and Chinese. The graphs for the Hawaiian-Asiatic crosses take the intermediate position. The South Europeans show a slightly lower index than the Hawaiians and their crosses are apparently intermediate, certainly neither higher nor lower than the parental stocks. It is not strange, then, that the Hawaiian-Asiatic-Europeans fall between the Hawaiian-Asiatics and the Hawaiian-Europeans. The amount and rate of growth for all the Hawaiian crosses together with the behavior of the increments and the reversal points for the sexes are similar to that for the pure groups.

The relative span among the crosses is closely parallel to relative span in the pure groups. As noted, the difference between the sexes is greatest for the Hawaiians and the North Europeans. That this is a real inherent difference is clear since in the crosses the greatest difference is found among the Hawaiian-North Europeans.

Sitting Height

In absolute sitting height, the North European is superior to all our groups. The decreasing order of magnitude is: North European, South European, Hawaiian, Korean, Chinese, Japanese. The absolute amount of growth is about the same as for stature and the sex graphs cross at thirteen to fourteen years for Hawaiians, North Europeans, and Chinese; for the other groups at fourteen to fifteen years. The increments, however, cross at twelve to thirteen throughout (smoothed series). The peaks for variabilities occur at the following ages:

	Male	Female
Japanese	13	11
Chinese	14	11
Hawaiian	11	12
North European	13	12
South European	13	12

A comparison of the North European children in Hawaii with the Worcester data shows the sitting heights about equal. Since certain differences exist in stature for Chinese children in China, it may be added that Appleton's girls (1) show a greater sitting height throughout than is noted for Chinese girls in Hawaii.

Relative Sitting Height

The relative sitting height, expressed in the usual way, shows marked age changes; while in general there is a decline in the index with age, the graphs reach their lowest points at about fourteen years, then rise again, but not to the six year level. To put the matter another way, the index is high at the beginning of school life and falls rapidly to fourteen years, after which there is a moderate rise.

The relation of the sexes is fairly consistent in all race groups, in that girls of six to ten years are slightly lower, but later the girls tend to be higher than the boys. The ages at which the trends for the sexes cross vary somewhat, but always occur before the thirteenth year. From the increments it is clear that girls tend to grow faster in relative sitting height during the period from eight to thirteen years, that is, the index falls faster, but after that period the boys lead in this fall. The actual minimum indices in smoothed series occur at the following ages:

	Male	Female
Hawaiian	14	15
Chinese	14	13
Japanese	13	13
North European	14	12
South European	15	12
Korean	15	12

Correlations

In a study of Worcester children, it was shown that the coefficients of correlation for stature and sitting height increased to the thirteenth and fourteenth year and then declined. Accordingly, these coefficients have been calculated for Hawaiian boys by the short formula (see p. 123):

Hawaiian Males

Age	r
7	.87
8	.78
9	.83
10	.89
11	.93
12	.90
13	.78
14	.93
15	.90

HEAD LENGTH

During childhood there is considerable growth in the absolute size of the head. The data in Table XVI bring this out clearly. It will be noted first, that growth is fairly uniform from six to nineteen years, with no easily observed period of acceleration. The boys throughout exceed girls in maximum length of head and there is no crossing of the sex graphs for absolute length. The differences between boys and girls widen with age, however.

The race groups maintain their relative positions with respect to each other throughout the growing period. Thus, the Chinese and Japanese have a relatively short head at six years and again at nineteen years. The Hawaiian and South Europeans enter school with head lengths about equal and end the same way. The North European starts with the longest head and so ends.

Shirokogoroff and Appleton (38) give an age series for Chinese girls, in which the yearly averages exceed Chines girls in Hawaii, in both length and breadth of head. The cephalic index is a trifle higher, but tends to fall with age.

Hawaiian Crosses

In absolute head length, the Hawaiian-Asiatics appear intermediate, possibly a little nearer the Chinese; the Hawaiian-European crosses are also intermediate. The head lengths of the Hawaiian-Asiatic-Europeans run closely parallel to the Hawaiian-South Europeans, but are intermediate to the Chinese and North European crosses.

Since there has been a good deal of discussion over the reality of head changes among emigrant peoples, it is interesting to compare the data from North Europeans in Hawaii with those for children from Worcester, Massachusetts. Superposing the growth curves, we find absolute agreement for both boys and girls. If these groups of children are strictly comparable, residence in Hawaii has produced no change in head length. It is evident, however, that the variability of the Hawaiian whites is greater than in the Worcester series.

WIDTH OF HEAD

Growth in width of head is similar to that for length and the relations of the sexes are similar. A comparison of Worcester children with the series for North Europeans in Hawaii shows the boys in close agreement, but the Hawaiian white girls have a slightly narrower head. Comparing the several race groups, it appears that the South European children have the narrowest head, the North Europeans next. The Japanese have the widest head, but little difference can be seen between this group and the Hawaiians. Between the South Europeans and the Hawaiians on the

one hand and the Japanese on the other, stand the Chinese and North Europeans. Strange to say, Chinese and North European children are about identical in head width. However, these differences are far from certain.

A further comparison of sex differences indicates that, with age, the sexes move farther apart in head length than in head width.

In the Hawaiian crosses, the width of head for the North European cross is practically the same as for the South European and the Hawaiian-Asiatic cross shows a still wider head, wider than the ancestral Chinese and almost as wide as the Hawaiians. The South European cross is intermediate. The Hawaiian-Asiatic-Europeans present a head width greater than that for the North European cross and closely parallel to that for the Hawaiian-Asiatic group. There is in this the suggestion that Hawaiian width of head, or a large head, tends to over-ride the inherited elements. But no cross exceeds in size the head of either parental stock.

Porteus and Babcock (27, pp. 170-171) present a table of head measurements of Chinese and Japanese children in Honolulu, ranging from six to fifteen years. The lengths and breadths are uniformly higher than in the Hawaiian series, approximating a constant difference. On the other hand, the standard deviations are comparable. In this table the Japanese have wider heads than the Chinese, but the Chinese exceed in head length. No measurements were taken by Sullivan of auriculo-bregmatic height of head. This measurement is of great anthropological importance and interest but is usually not taken because there has been until recently no instrument for taking the measure. Porteus and Babcock (27) report measurements taken in Hawaii of Chinese and Japanese children. The instrument used was a radiometer devised by Porteus. The measurements indicate that in both races growth in head height is steady from six to fifteen years, and boys exceed girls at every age. Sex differences in rate of growth are, however, not apparent. Japanese tend to exceed Chinese in this measurement, but the differences are more significant in the case of Japanese boys. In brain capacity as calculated from three measurements, length, breadth, and height (Lee's formula no. 14) the Japanese of both sexes possess an advantage over Chinese of equal ages.

CORRELATION AND AGE IN HEAD DIAMETERS

Pearson (24, p. 25) once pointed out that the coefficients of variation and of correlation were higher for infants than for adults. Tschepourkowsky (48, p. 291) also notes the same phenomenon for five head and face measurements. This, if true, suggests that a series of successive correlations for the age groups in the data here presented will reveal progressive changes in values of *r*. In bodily dimensions, for which indices have been calculated, the correlations between these dimensions can be estimated by the Pearson short formula:

$$r=\frac{Va^2+Vb^2-Vi^2}{2VaVb}$$

In this formula, Va and Vb are the respective coefficients of variation for the two measurements taken, and Vi the coefficient of variation for the index. According to this, correlation coefficients for the head diameters among the several race groups have been calculated.

My experience with this formula, however, indicates that it tends to overestimate the degree of correlation, but, in the main, gives the correct sign. The difference between trial correlations, calculated in the usual manner and those obtained by the use of the short formula are as follows:

Group	Sex	Age	n	Short Formula	Actual Formula
Japanese	F	10	103	—.313	—.127
Japanese	F	15	65	+.079	—.017
Chinese	M	10	73	—.237	—.236
Chinese	M	15	49	+.256	+.234
Chinese	F	10	67	—.239	—.361
Portuguese	F	10	51	+.235	+.167
Portuguese	F	15	40	+.045	—.027

Considering the small numbers, the differences in the values of *r* are negligible. Accordingly, the short formula has been used to calculate the coefficients by age for length and breadth of head, as may be seen in the tables. Erratic variations appear, as may be expected with so few cases, complicated by the inaccuracy of the formula itself; yet certain tendencies appear. Thus, there seems a slight tendency for the younger children to show negative correlations until eleven to fourteen, when the trend is toward positive correlations.

Studies of American children have shown that with body measurements the correlation coefficients reach their maximum at 12 to 14, after which they again decline. For head diameters the result has been uncertain, chiefly because of the

low degree of correlation. But the striking character of Sullivan's data in contrast to that for American children is the large number of negative values.

Pearson and Tschepourkowsky have shown that when head diameters are taken for inter-racial groups the value of r is negative; or a long head is accompanied by a narrow head. Within a homogeneous group r is positive, as a mere size correlation (22, pp. 210-12). Boas and others have assumed that a low correlation for head diameters will be found in all kinds of mixtures and that the relative size of r is an index to purity. This would follow from the above.

This applies to adults, but it may be that this factor is in part operative among children. But if there should be a large error in the data, these negative coefficients may be explained as fluctuations around a low positive correlation mean. The averages for males in the age series are as follows:

Hawaiian	—.056
Chinese	+.008
Japanese	—.056
North European	—.036
South European	+.121
Hawaiian-Asiatic	—.003
Hawaiian-North European	—.008
Hawaiian-South European	+.002
Hawaiian-Asiatic-European	—.135

	m	f
Japanese (6000-200, Matsumura)	+.048	+.041
Hawaiians (205-175)	+.210	+.152
Hawaiian-Asiatic (33-30)	+.346	+.101
Samoan (70-23, Sullivan)	—.097	+.093
Tongan (Sullivan)	+.279	—.060
Marquesan (84-74, Sullivan)	+.516	+.036
Sioux Indians (538-156, Sullivan)	+.270	+.380

These are largely positive in contrast to the negative tendencies of the children, as shown below. On the other hand, young children tend to be negative; hence, the average of the total age series for children to approximate zero may be expected. Hence, so far as the data go, they suggest the order of growth to be from a negative to a positive correlation.

The initial motive for calculating these correlations was to compare the pure groups with the crosses. As stated, the usual assumption is that the correlation for crosses is less than for the unmixed, but careful study of Sullivan's data for children suggests no such distinction. Smoothed values and the resulting graphs show a slight trend toward higher positive coefficients in later school life, as in the unmixed groups. It is of further interest to note that much the same lack of difference between the mixed and unmixed was observed among Indian children (42, p. 158).

TABLE VII. COEFFICIENTS OF CORRELATION FOR LENGTH AND WIDTH OF HEAD

	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
MALE															
Hawaiian	—.100	—.143	—.417	—.252	—.135	+.177	—.009	—.054	+.071	+.155	+.048				
Chinese	—.177	—.094	—.234	+.003	—.237	—.125	—.473	—.314	+.003	+.256	—.104	—.228	—.194	+.656	
Japanese	—.025	—.180	—.191	+.057	—.225	+.161	—.136	—.114	+.224	+.018	+.113	—.214	+.003	+.331	—.377
N. European	—.299	+.037	+.015	—.182	—.040	+.045	+.183	+.248	—.215	+.234	+.312	+.148			
S. European	—.123	+.064	—.006	—.006	+.379	+.205	—.068	+.0004	—.009	+.028	+.303				
Haw.-Asiatic	+.350	—.255	+.094	—.234	+.158	+.081	+.415	+.157	—.248	—.112					
Haw.-N. European	—.091	+.027	—.133	+.150	—.159	—.296	+.008	+.001	+.317	—.208	+.368	—.143	—.167	+.111	
Haw.-S. European		—.161	+.147	+.066	—.303	—.118	+.297	+.274							
Haw.-Asiatic-Eur.		—.012	+.372	+.031	—.336	+.423	—.677	—.423	—.611						
FEMALE															
Hawaiian		—.245	—.324	—.050	—.184	—.006	+.234	+.100	+.182	—.131	+.124	+.123			
Chinese	—.043	—.015	—.251	—.196	—.239	+.0003	—.247	—.045	+.043	—.203	+.303	—.046	—.227		
Japanese	—.356	+.203	+.025	—.313	—.114	+.138	+.074	+.098	+.080	—.148	+.407	—.269			
N. European	+.571	+.259	+.067	+.029	—.366	—.147	+.161	+.136	+.539	+.373	+.390	—.153	—.071		
S. European	+.635	+.251	+.191	—.003	+.235	+.220	+.200	+.150	+.124	+.045	+.333	+.375			
Haw.-Asiatic	—.468	—.297	+.118	—.267	—.104	—.079	+.133	+.207	—.108	+.114	+.179	+.232	—.562		
Haw.-N. European	—.260	+.368	—.235	+.104	+.198	+.198	+.227	—.096	—.299	+.111	—.093	+.203	+.323	+.172	
Haw.-S. European		—.141	—.124	+.263	—.457	+.326	—.655	+.414	+.364	+.476	+.049				
Haw.-Asiatic-Eur.					+.227	+.190	—.269	+.424	—.629	—.182	+.424	—.319			

This may indicate a tendency to zero correlation. If, however, the variability of the series is high and erratic, and the negative coefficients are mostly due to this, then we might expect the values of σ to be higher when the correlation coefficient is negative. This is found to be true. As a check upon this, the same is true for cephalic index and stature (9, p. 459).

For adults the following may serve as sample correlations:

THE CEPHALIC INDEX

Following a discussion of head diameters, consideration may be given the cephalic index as an expression of head form. Racial comparisons in head form are based upon adult data; hence, the point of departure in this study should be growth in the cephalic index. The status of this subject may be summarized thus: during school life the numerical values for this index among white children have been observed to fall from higher to

The sexes are about equal, but there is a slight tendency for boys to show higher indices.

FACE HEIGHT

In gross face height, the groups rank as follows: Hawaiian, Korean, Japanese, Chinese, North European, South European. The Japanese and Chinese are very near together, much nearer than the North and South Europeans. The amount of growth is considerable. The boys lead the girls; at ten to twelve years they are about the same, but after thirteen years, they rapidly diverge.

The increments show that the girls lead in growth up to twelve to thirteen years, passing through the maximum period of growth; the acceleration for boys begins after thirteen years and reaches its maximum at fifteen to sixteen.

The magnitude of sex difference is greatest for the European groups.

The Hawaiian crosses take intermediate positions in the ancestral groups. The Hawaiian-Asiatic, the North European cross, and the tri-cross, are very near together.

Schwerz (35) measured face height among 1778 children, the consecutive age averages closely agreeing with our North and South European data. For other growth tables see Martin (21, p. 609).

ANATOMICAL FACE INDEX

It is usual to characterize the face by an index for height and width, the resulting index being comparable to the cephalic index. In gross index, the groups, rank: South European, Hawaiian, and North European, Korean, Chinese, and Japanese.

This anatomical face index rises rapidly with age and boys lead, the sexes diverging rapidly after the thirteenth year. More irregularity is shown in this index than in most others and the variabilities are more erratic. Nevertheless, one tendency is clear in all groups, mixed or pure, the maximum index for girls occurs at about fifteen years; for boys later.

Since a large difference exists between the parent stocks, the Hawaiian-Asiatic are intermediate, but much nearer the Chinese level; the Hawaiians and North Europeans are about equal and so their crosses agree closely with them; for the South European crosses the tendency is to follow the Hawaiian level. The Hawaiian-Asiatic and the Hawaiian-North European groups show a difference, the Hawaiian-North European having the higher index throughout. The tri-cross seems to be intermediate.

Schwerz (35) and Porter(26) show that this index rises with age.

TRANSVERSE CEPHALO-FACIAL INDEX

The transverse cephalo-facial index gives the relation between the maximum head width and the maximum face diameter, or the relative face width. The rank of the groups (males) is Korean, Chinese, Hawaiian, Japanese, North European, and South European.

At the outset, the girls have the higher index, or the relatively wider face, but at the sixteenth year the boys overtake the girls. The increments, however, show no periodic sex differences.

In general, the index rises rapidly with age and apparently continues to rise for some time after the nineteenth year. It is striking that each group starts at about 82 (males), but that at sixteen to seventeen, their positions are: Chinese, 91; Korean, 92; Hawaiian, 89; Japanese, 90-91; South European, 87-89; North European, 88-90. These positions are a little different from the average rank in all age intervals, as may be expected. The females all start around 83 and, as above, stand: Chinese, 91; South European, 90-91; Japanese, 89-90; Hawaiian, 89; North European, 88-89. This suggests that the adult racial width of face is determined by the degree of growth.

The foregoing conclusion is borne out by the crosses, all of whom begin school life with the same approximate indices of 82 and 83, respectively. The amount and direction of growth seems comparable to that for the parental stocks. It will be noted that the Hawaiians and the stocks they cross with are near together, so fine distinctions cannot be drawn as to the position of the crosses. At sixteen to seventeen, the males stand:

Hawaiian-Asiatic	88.7—90.9
Hawaiian-North European	89.6—89.9
Hawaiian-South European	88.2—88.8
Hawaiian-Asiatic-European	89.3—90.7

What differences there are cannot be taken as distinctive.

TRANSVERSE FRONTO-PARIETAL INDEX

The transverse fronto-parietal index expresses the relation between the minimum frontal diameter and the maximum width of head as usually measured. In rank, the groups by males show a clear lead for the North Europeans, with a rela-

The amount of growth in the width of the face is considerable; the boys lead the girls but around the eleventh year, they are very near together, diverging thereafter. The increments of growth show that, at the outset, the girls lead, but later, the boys lead; the crossing point is about at eleven to twelve for the Hawaiians and Chinese, at twelve to thirteen for the Japanese and North Europeans, and at fourteen for the South Europeans (35).

Hawaiian and Chinese are about identical in face width, year by year; the crosses are also equally identical. This is interesting genetically and goes far to guarantee the integrity of the samples.

The Hawaiian face is much wider than the North European; the cross is intermediate, but is nearer the Hawaiian level. Naturally, this may be due to the Hawaiian back crosses in the group. The difference between the Hawaiian and the South European is still greater, but again the crosses are nearer the Hawaiian level. The Hawaiian-Asiatic-European is practically identical with the Hawaiian-Asiatic cross.

The available literature on crosses is not extensive, but Boas (6) gives a table of Indian-White crosses in which their position is intermediate to the parental stocks. Schwerz (35) shows that the faces of children in Schaffhausen, Switzerland, grow wider with age; both sexes starting with faces of about the same width as the North European series here presented, but ending with wider faces. In other words, they grow faster. The faces of the South European children in Hawaii tend to be lower throughout. For a comparative table of European and American children, see Martin (21, p. 610).

ZYGOMATICO-FRONTAL INDEX

It is customary to compare the maximum face diameters with the minimum frontal head measure. Sex differences in this index are not certain, though the tendency is for girls to lead. The increments, when smoothed, show no periodicity and fall steadily during the entire school period. So, growth results in a decline in this index, and the respective groups show differences in amount. The greatest change is observed among Hawaiian and North European boys. For girls the differences are less marked, but Hawaiian girls lead. The Hawaiian index declines the most with age, with the North European a close second.

Remembering that Hawaiians enter into all the crosses, it is not surprising that the degree of index fall is large in all these crosses. However, there is consistency in that the fall for the North European cross is greatest. In position the crosses seem to be intermediate.

BIGONIAL WIDTH

The bigonial diameter may be expected to correspond closely to that of the face, the order of which as shown in the age graphs was: Korean, Japanese, Hawaiian, Chinese, North European, South European. The order in bigonial width is not quite the same, but approximately so.

The amount of growth is similar to that for other diameters of the head and face. The boys lead throughout, but from eleven to thirteen years the sexes are near together, and after fourteen years, they rapidly diverge. The increments of growth show a tendency for the girls to lead from ten to twelve years, but after thirteen the positions are reversed. The maximum increments for girls occur before fourteen, for boys, later.

The crosses parallel the ancestral groups in growth. In bigonial width the Hawaiians and Chinese do not differ greatly so it is not strange that a decision cannot be reached as to which of these parental stocks the crosses most resemble. On the other hand, the North European crosses are clearly intermediate; as are the South European crosses, but nearer the Hawaiian level.

Bigonial measurements for children are rare, but Reuter (32) gives a series for both boys and girls. His averages are higher than for our European children.

ZYGOMATICO-MANDIBULAR INDEX

Dividing the width of the mandible (the bigonial diameter) by the width of the face, gives another aspect of facial form. The group differences with respect to this index are small, and because these race groups present different behaviors in growth, it is not easy to rank them. Taking the period from nine to sixteen years, in which most of the cases fall, the Hawaiians show a falling index, the Koreans a rising index. The other race groups show little change. However, all these differences are minute and uncertain. In contrast to other indices of the face, there is scarcely any appreciable change with age. Taking approximate mean values, the rank of the race groups seems to be: Korean, Hawaiian, North European, Japanese, Chinese, South European.

From these ages on, the cephalic indices of these children fall and eventually reach the adult level.

Data on the head in embryo are available. Schultz (34, pp. 502-03) demonstrates that the cephalic index decreases during foetal life; in the third month it amounts on an average to 87 and may be as high as 98. The material upon which this conclusion rests seems to be American white. Taken with data on the living, this indicates that the whole process of head formation is from round to long, but the movement is not a straight line, nor is it a simple curve. In embryo, the index falls rapidly, but after birth rises at almost equal rate (as suggested by the European data cited) until the three to six year age period. While more data are needed to complete this picture of growth, its rough outline is suggested.

The outcome of this study is, then, that while the fall of the cephalic index after the three to six year period is universal, it is especially evident among the round-headed races. In general terms, the rate of decrease in the index during the period indicated seems to vary directly with the index itself. Also the differences between the sexes at stated points in the growth curve vary in the same way. It is suggested, then, that the cephalic index, as both a sex and a race character, is a function of a more complex growth character and that the origin and significance of the race index cannot be approached until the race type processes in growth are known, not merely beginning with school age, but from early foetal life.

MINIMUM FRONTAL

In children the minimum frontal diameter is not usually studied and is frequently ignored in adults. It seems to have high diagnostic value. First, the North Europeans greatly exceed the South Europeans and very slightly the Hawaiians in absolute diameter. In the first few years of school life they exceed the Japanese, but later their growth curves are coincident. Compared with the Chinese, the differences are marked at first, but later the North Europeans exceed them by a very small margin. So the Japanese are slightly in excess of the Chinese. The Koreans clearly exceed the North Europeans. In descending order, the groups are: Korean, North European, Hawaiian, Japanese, Chinese, South European. This is different from the maximum width of head, for which the order was: Korean, Japanese, Hawaiian, Chinese, North European, and South European.

In growth large changes take place with age, but there is a tendency to slow down after the fifteenth year. This is especially clear when the smoothed increments series is observed. Before the twelfth to the thirteenth year, the tendency is for girls to show the greater increment, but after that, the boys lead. Hence, there is a crossing of the graphs, as in other characters.

Table XIX shows that while the boys lead throughout, they are practically identical with girls at eleven to thirteen in all groups, except the Korean, where the identity is earlier and where the girls lead the boys from ten to fifteen. The Korean series is, however, the least satisfactory.

The groups are highly individual in variability and yet the sexes tend to run parellel. In general, there is a rapid fall in variability to about ten years, it then rises somewhat to about the fifteenth year.

In the mixed groups, the amount of growth and the relation of the sexes are similar to the pure groups. In size, the Hawaiian-Asiatic seem to be intermediate in later life, but at the outset and until about the thirteenth year the males, at least, are nearer the Hawaiian than the Chinese; in fact, they show a very slight tendency to exceed; yet, this changes in later life.

The Hawaiian-South European cross also shows a tendency to follow the Hawaiian level rather than the much lower South European. For the Hawaiian-North European crosses, the position seems to be intermediate; yet, there is a suggestion that the cross follows the North European norm rather than the Hawaiian. The Hawaiian-Asiatic-European group is practically coincident with the North European cross.

Reuter (32) gives a series of 189 boys and 184 girls from Pollnow, Pommeria, Germany, six to fourteen years, for whom the amount of growth during the interval is comparable to the white series in Hawaii. Schwerz (35) gives a similar series.

FACE WIDTH

In gross face width, the Koreans stand first in both sexes; the Japanese second. The narrowest faces are found among the South Europeans, both sexes; North European faces are wider. Chinese and Hawaiian faces are about the same, falling between the Japanese and the Northern Europeans.

children. To check this observation, Table VIII was compiled. Three age periods are used here, each value in the table is the average for three consecutive years, giving in this way three points in the smoothed growth curve for each race group. In this tabulation we observe that the greatest differences pertain to the Asiatics, the least to Europeans. The conclusion, therefore, is that while the fall in index with age is universal, there are race differences in the rate of such fall.

Relative Age Changes in High and Low Cephalic Indices

The amount of decline in cephalic index, from the time of entrance into school to adult life, was greatest for the Hawaiians and Asiatics, suggesting the possibility that the difference lies in the growth of round and long heads. Subtracting the indices in the third column of Table VIII from the first, ranks the several race groups according to the degree of change with age. To facilitate comparisons, the groups have been arranged according to the indices for the six to eight year age period.

From the column of differences it appears that the larger variations tend to accompany the high indices and this relation will persist when the differences are reduced to relative values. The tabulation of corresponding data for the female head gives a similar result, though the differences are smaller. This then confirms the assumption that there is a race difference in growth changes of the cephalic index from six years to maturity, or, that the decline of the index with age increases as the race index rises. If it is correct to say that it is growth in head length that causes the decline, then the amount of increase in head length is greatest among the races of rounder heads.

Sex Differences in Age Changes

So far only race differences in the degree of reversion to a longer head have been considered, but race differences in the magnitude of sex distinctions are revealed at the initial and terminal points of the school period. As observed (Table IX), these sex differences change in algebraic sign from six years to maturity, but this need not cause confusion in estimating the relative magnitude of the differences at any one period. Table IX shows that in comparison of the sexes also the greater differences accompany the races of rounder heads.

TABLE IX. COMPARATIVE SEX DIFFERENCES IN CEPHALIC INDEX

6-8 Years

	Male	Female	Difference
Korean	87.4	85.1	2.3
Japanese	87.0	86.4	0.6
Hawaiian	86.0	84.0	2.0
Chinese	85.5	84.3	1.2
Sioux (Sullivan)	81.9	80.7	1.2
South European	81.4	79.9	1.5
Australian Whites (Berry-Porteus)	79.5	79.4	0.1
English (Pearson)	79.5	79.4	0.1
North European	79.3	79.2	0.1
Sicilians (Boas)	79.2	79.7	0.5
Worcester (Boas)	79.0	80.0	—1.0

18-20 Years

	Male	Female	Difference
Japanese	82.0	85.8	—3.8
Hawaiian	82.0	85.5	—3.5
Chinese	81.9	83.0	—1.1
Sioux (Sullivan)	80.0	81.4	—1.4
South European	80.1	80.9	—0.8
Australian Whites (Berry-Porteus	78.9	79.0	—0.1
English (Pearson)	79.4	79.7	—0.3
North European	77.2	78.4	—1.2
Sicilians (Boas)	78.1	77.8	0.3
Worcester (Boas)	78.5	79.2	—0.7

That the differences observed are a phase of growth appears in consideration of the adult sexes. As stated, the tendency is for the adult female head to be rounder than that of the male, but the magnitude of this difference is far less than during the growing period. Nor is there reason to expect that in adult life the larger differences go with the rounder heads, since the available data show no such tendency. So the sex differences observed during the growing period and the suggested correlation between the magnitude of these differences and the form of head are to be interpreted as growth characters.

The Pre-School Period

So far only the growth span from six years on has been considered; obviously, it is desirable to know what happens to those race groups from birth to school age. For this early period there are little data, and those for European children only. Ranke's observations (30) were made among Germans, standing in an intermediate position as between Korean and United States white children. If the principle of sex differences holds at birth, larger differences for Koreans at birth and less for United States white children should be expected. Ranke's tables show the maximum cephalic index for German females to be reached at two to three years, for males at five to six.

Holstein (30), all show the same slight drop with age. As to sex differences, Porter's girls exceed the boys until the fifteenth year, when they reverse; girls uniformly exceed the boys in the Worcester data; the girls of Holstein have a lower index until about fifteen.

Hrdlička (18) measured white children in New York showing the decline with age and the tendency for the girls to reverse their position from a lower to a higher index at the fifteenth year. Also, colored children were measured, showing the same tendencies, although the values are erratic.

For Chinese males, the recently published tables of Shirokogoroff (37) show a marked drop during school life. For females, a small series, by Appleton (1), also shows a decline with age. Finally, Sullivan (42) published data on Sioux Indian children which show a definite tendency for a drop with age, and, to a slight degree, the girls are first lower and then surpass the boys at fifteen.

The observations of others are, therefore, consistent with the data of Sullivan and confirm the assumption that among all races the tendency is for the cephalic index to decline with age.

It is usually assumed that the cause for this lies in the length of the head rather than in its width. Ripley (33, pp. 888-89) observed in repeated measurements of college males that there was growth in length of head from eighteen to twenty-three, but no growth in breadth. Naturally the index decreased. This result was confirmed by Berry and Porteus (4). Rehak (31) gives data on Czech boys showing that, in general, length of head increases over breadth, thus causing the cephalic index to fall. The periods of acceleration for both diameters were from six to eight years and from twelve to fourteen, the tenth year being the lowest point in the increment curve.

However, an exception is claimed by Fleming (16) for some Welsh children whose breadth of head seemed to grow faster than the length, resulting in an increasing index. As to the sexes, girls show little change after eight years; boys, on the contrary, were stable until ten years, after which the index changed rapidly. However, Pearson (25) reviewing this work, decides that no significant changes occur. However, Berry and Porteus (4), using Australian white data, found a slight tendency for the index to fall with age. Sullivan's data, however, bring out clearly a sex reversal in position as respects the cephalic index. That the boys lead for a time with a high index, but lose this lead to the girls at about fifteen years, implies that there is a sex difference in the rate of growth for the head diameters. From Table XVII it appears that the growth of head width is slower than the growth in head length, which would account for the universal fall in index with age. Yet, a sex difference is apparent in length of head in that boys show an acceleration of growth in head length setting in at about fifteen years. Inspection of the tables shows no certain difference in rate of growth from first to last. Length of head, on the contrary, shows an accelerating rate, setting in on or before the fifteenth year.

While these statements apply to all the race groups, some differences in degree are suggested: in width of head, the sex difference for Hawaiians, Chinese, and Japanese is greater than for the Europeans; in length of head, the degree of sex differences are about the same for the two groups.

The available literature may now be noted. The white series for Worcester, Massachusetts (8), gives little indication of sex differences in acceleration for length of head. On the other hand, Boas (5) observed that the tendency for white children, particularly European, was for the males to accelerate in length of head at the fifteenth year to a much greater degree than females, and relatively greater in length of head as opposed to width.

Race Differences in Fall of Cephalic Index

In comparing the degree of fall in cephalic index among the race groups in these data, some suggestive tendencies appear. Thus, the relative fall of index is greater among the Hawaiians, Chinese, Japanese, and Koreans, than among white

TABLE VIII. AGE DIFFERENCE IN THE CEPHALIC INDEX—MALES

	6-8	12-14	18-20	Difference
Korean	87.4	85.6	83.2	4.2
Japanese	87.0	84.8	82.0	5.0
Chinese (Shirokogoroff)	86.5	82.4	81.5	5.0
Hawaiian	86.0	84.3	82.0	4.0
Chinese	85.5	83.2	81.9	3.6
German (Ranke)	84.5	81.8	.....	....
Porto Rico (Boas)	84.4	83.5	.....	....
Switzerland (Schwerz)	83.6	83.6	82.7	0.9
Sioux Indian (Sullivan)	81.9	80.1	80.0	1.9
South European—Hawaii	81.4	79.5	80.1	1.3
New York White (Hrdlička)	81.2	80.9	.....	....
Australian Whites (Berry-Porteus)	79.5	79.2	78.9	0.6
North European—Hawaii	79.3	78.8	77.2	2.1
New York Sicilians (Boas)	79.2	79.2	78.1	1.1
Massachusetts White (West)	79.0	79.2	78.5	0.5
English (Pearson)	79.0	79.0	79.2	—0.2
New York Negro (Hrdlička)	76.6	76.7	.....	....

lower, or, the heads of both sexes become relatively longer. Table XVIII gives the successive indices according to age, from which it can be noticed that in all race groups the tendency is for the value of the index to fall with age. It is, therefore, not only white children in whom this peculiarity is to be found; the probability is that it is universal. However, a comparative study of the race and sex groups in the tables here presented reveals both race and sex differences in this respect.

In considering first the Hawaiian, Chinese, Japanese, North European, and South European groups it is apparent that during the earlier part of school life the boys show a higher index than the girls, without exception, while in the post-puberal period their positions are reversed. To express the relation in terms of the cephalic index, before puberty the male head is rounder than that of the female; after puberty the female head is the rounder.

The number of cases leaves much to be desired, especially in the advanced ages, but the correspondence of the separate groups adds greatly to the certainty of the result. For the American, Korean, and South European there are too few after sixteen years to be comparable, but in each the boys lead in the first years of school life. The data at hand then suggest that there is a fundamental difference between the sexes in respect to cephalic growth.

The period of transition occurs around the fifteenth year for the Hawaiians, Chinese, Japanese, and North Europeans, and for the Americans, around the sixteenth. As shown in Table XVIII the change in the relation of the sexes for the South Europeans occurs between the twelfth and thirteenth years, and the same is suggested by the Korean series.

The boys of the mixed groups again show higher indices at the outset for the Hawaiian-Asiatic, Hawaiian-North European, Hawaiian-South European, and Hawaiian-Asiatic-European. The transition is clearly shown for the Hawaiian-Asiatic-European and the Hawaiian-North European at fifteen years, while the Hawaiian-Asiatic and the Hawaiian-South European are less regular, but the positions of the sexes are definitely reversed after sixteen years. All these differences are much more apparent when the series of yearly averages are smoothed in the usual way by averaging each successive trio of values (fig. 4).

As to adult sex differences in cephalic index, there seems to be good evidence that more often than not the index for females exceeds that for males. The tables and discussions of Rudolf Martin review the evidence supporting this conclusion (21, p. 663). Other observers have, from time

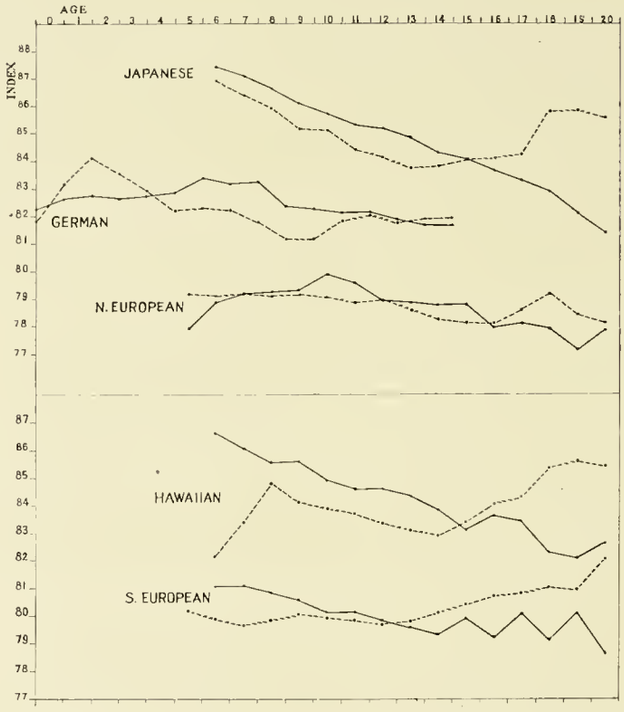


FIGURE 4.—Growth changes in the cephalic index. The German data are from Ranke. A preliminary statement for these changes was published in School and Society to which acknowledgment is made for this figure.

to time, noted the same sex differences, so without further citation it may be assumed that this difference in the cephalic index is a general human adult sex character. Hence, it follows that if in the groups studied the relation is reversed in early school life, there must be a period in which the crossing of growth curves is made. In so far, the observations are consistent (49).

Before proceeding with this analysis, it may be well to review the work of other investigators, to see in how far this observation is confirmed. For European children the tables of Boas (5) give age series for Bohemians, Slovak and Hungarians, Poles, Jews, Sicilians, and Neapolitans, and in each of these seven groups the cephalic index falls with age to about the same degree as that of the white children of Hawaii. The sex differences are not marked, but what tendency exists is for the females to rise above the males after the fifteenth year.

Porter's tables for St. Louis schools (26), the Boas data (8) for Worcester, and Ranke's for

tively high index; the Hawaiians seem to have the lowest index, the Chinese, Koreans, and Japanese, a little higher. The South Europeans stand between the Chinese and North Europeans. For females, the North Europeans and Koreans lead; otherwise, the relations are about the same.

In sex differences, the females have a higher index throughout.

The change in the index is shown in Table XXVII. In contrast to the cephalic index, the values rise with age, continuing through school life, though the increments of increase show a steady decline. There is no evidence of a sex difference in rate.

In magnitude of index the crosses rank as follows: Hawaiian-North European, Hawaiian-South European, Hawaiian-Asiatic. The Hawaiians and Chinese are so nearly alike that all that can be said of their cross is that the index follows the parent stocks. The two European crosses are intermediate; the tri-cross is intermediate to the two constituent crosses.

Schwerz (35, p. 31) gives a series for 1778 children in which this index is shown to increase with age for both boys and girls. The index itself is perceptibly lower than in the North European and South European groups. The individual diameters for minimum frontal seem about the same as for the South Europeans, but perceptibly less for the North European series.

NOSE HEIGHT

Because of the considerable variation it is difficult to rank the groups as to gross nose height, but it is clear that the Hawaiians and the Koreans lead. The North Europeans seem to stand next and just below them are the Chinese, Japanese, and South Europeans.

The amount of growth is considerable. Boys tend to lead throughout. There is a tendency on the part of the girls to lead at eleven to twelve years, but after thirteen the boys forge ahead more and more. The increments are consistent with this, the growth curves of the sexes showing a disposition to cross at twelve to thirteen years.

With the crosses, the nose is intermediate in height. The Hawaiian-Asiatic cross and the Hawaiian-Europeans are about on the same level and the tri-cross coincides with them.

NOSE WIDTH

In nose width the rank is, Hawaiian, Chinese, Japanese, Korean, South European, and North European. The amount of growth is considerable. At the beginning of school life, boys have the wider nose, but at about the tenth year, the girls take the lead, to lose it again at about fourteen. From then on the differences between the sexes rapidly increase. Apparently growth is not complete at twenty years.

The increments are consistent with the above: the girls surpass the boys between nine and thirteen years and achieve their maximum increment at this time; the boys accelerate at thirteen to fourteen and reach their maximum later.

The Asiatic cross has a much wider nose than the European cross. The nose of the South European cross seems a trifle wider than in the North European cross. In these crosses the nose is intermediate, but tends to be nearer the Hawaiian level. In the tri-cross, the nose appears intermediate to the Hawaiian and the North European.

NASAL INDEX

In nasal index the relative rank for the groups is: Hawaiian, Chinese, Japanese, Korean, South European, and North European. The differences are considerable.

In growth, the index falls, the greatest changes occurring in the groups with the lower indices. No certain sex differences appear, neither in the index nor in growth. In general, no periods for growth appear, the increase being steady.

There being little difference between the Hawaiians and the Chinese, it is consistent to find that the Hawaiian-Asiatic cross is the same as the parent stocks. On the other hand, the European crosses are intermediate in position, because of the width differences in the parental stocks. Table XXX shows this clearly. Naturally also, the Hawaiian-Asiatic crosses have a higher index than the Hawaiian-Europeans. The tri-cross takes the intermediate position.

EAR HEIGHT

In ear height the rank is: Hawaiian, North European, South European, Japanese, Chinese, and Korean. Increase of ear height during school life is steady, but the data for adults suggests that the ear grows a great deal after the nineteenth year, though we have not the necessary cases to prove this. Boys exceed girls throughout in gross height, in later school life their growth curves diverge. The increments for growth show no certain sex differences, no

periodicity, merely a small steady decline with age until the eighteenth year.

The Hawaiian crosses with North Europeans give a greater ear height than with the Asiatics, which is consistent with the above ranking. In all the crosses the position of ear height is intermediate to that of the parental stocks.

EAR WIDTH

In width of ear, the groups rank: Hawaiian and North European, South European, Japanese, Chinese, Korean. This is the rank for ear height also, and therefore represents the rank for ear size.

The most surprising feature of ear width is the small amount of growth during school life. The largest increment of growth is observable in the North European group; the South European is next.

The boys lead in gross width, but the differences between the sexes seem not to increase with age before the eighteenth year. Neither are there certain sex differences in increments nor in periodicity.

The European crosses slightly exceed the Asiatic crosses in ear width. All the crosses are intermediate to the parental stocks. The Hawaiian-Asiatic-Europeans show a marked change with age, or they start at the Chinese level and rise to near the Hawaiian level. This is true of both sexes.

Some observations by Reuter (32, p. 301) show the ear height of German children about constant from six to fourteen years, whereas the ear width increases substantially.

EAR INDEX

The rank for ear index is Hawaiian, North European, South European, Chinese, Japanese, Korean. The differences between the Hawaiian and Korean are large, but as between the Hawaiian, the European, and the Chinese groups there is little difference.

Growth results in a falling index, the amount and rate seemingly the same for all groups. No certain differences between the sexes can be stated, though a slight tendency for the boys to lead appears.

The crosses are so nearly alike in index that no distinctions can be drawn. As just noted, the parental stocks are nearly the same in index.

TABLE X. AGE CHANGES IN WEIGHT (IN POUNDS)

HAWAIIAN

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	9	49.110	.....	.....	.....	6	46.000	*	.....	.....
7.5	19	52.105	6.696	.128	1.536	28	49.571	7.376	.173	1.487
8.5	28	54.714	6.181	.112	1.167	36	59.611	12.490	.209	2.081
9.5	29	60.897	8.624	.141	1.601	18	68.555	18.466	.269	4.352
10.5	37	68.216	9.992	.146	1.642	35	69.114	10.630	.153	1.796
11.5	34	75.264	9.505	.126	1.630	20	84.100	11.747	.139	2.626
12.5	27	83.963	10.149	.120	1.953	29	94.655	18.276	.193	3.393
13.5	21	89.381	13.820	.154	3.016	24	94.000	17.464	.185	3.564
14.5	31	107.451	18.682	.173	3.355	27	108.962	16.703	.153	3.214
15.5	16	121.250	14.765	.121	3.691	19	113.737	14.560	.128	3.340
16.5	7	138.857	.....	.....	.....	12	125.000	14.765	.118	4.262
17.5	6	140.000	.....	.....	.....	14	136.000	16.613	.122	4.439
18.5	3	141.666	.....	.....	.....	8	130.750	.....	.....	.....
19.5	3	145.333	.....	.....	.....	3	139.666	.....	.....	.....

CHINESE

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	5	36.000	.....	.....	.....	9	35.444	.....	.....	.....
6.5	49	40.204	4.915	.122	.702	37	39.784	4.691	.118	.771
7.5	82	41.988	4.215	.100	.465	77	42.312	5.115	.121	.523
8.5	70	47.371	5.119	.108	.612	61	45.148	5.723	.123	.733
9.5	76	51.566	5.923	.115	.679	73	50.638	6.869	.136	.804
10.5	73	56.164	8.017	.143	.938	67	56.791	10.100	.178	1.234
11.5	79	60.747	9.305	.153	1.047	55	63.000	11.874	.188	1.601
12.5	56	69.500	12.166	.175	1.625	67	71.478	12.450	.174	1.521
13.5	66	79.258	13.892	.175	1.710	55	80.546	15.588	.194	2.102
14.5	67	88.493	15.100	.171	1.845	69	87.623	12.767	.146	1.536
15.5	50	100.440	15.556	.155	2.199	56	93.839	12.490	.133	1.669
16.5	45	107.267	14.491	.135	2.160	43	99.716	14.457	.145	2.205
17.5	36	114.778	12.806	.112	2.134	38	102.737	8.456	.082	1.372
18.5	30	121.267	14.177	.117	2,588	14	102.714	9.316	.091	2.489
19.5	10	125.500	7.915	.054	2.243	8	108.500	.....	.....	.....
20.5	8	118.625	.....	.....	.....	1	153.000	.....	.....	.....

JAPANESE

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	39.000	.....	.....	.....					
6.5	74	39.878	4.100	.103	.477	57	39.649	4.643	.117	.614
7.5	104	43.404	4.777	.110	.468	119	42.311	4.519	.107	.414
8.5	108	47.695	7.538	.158	.725	96	45.011	5.985	.132	.611
9.5	99	51.202	5.771	.113	.580	55	50.563	7.385	.146	.754
10.5	102	55.706	7.591	.136	.752	103	56.456	8.022	.158	.790
11.5	82	60.061	9.394	.156	1.037	84	61.179	10.488	.171	1.200
12.5	106	67.651	11.269	.166	1.095	89	74.169	12.207	.164	1.290
13.5	101	76.762	13.153	.171	1.309	90	82.222	11.136	.135	1.170
14.5	124	89.411	15.875	.177	1.425	73	88.383	8.711	.098	1.020
15.5	107	101.290	11.662	.115	1.127	63	96.381	18.276	.190	1.490
16.5	88	107.727	14.663	.136	1.563	29	103.138	12.166	.118	2.260
17.5	60	115.650	13.928	.120	1.798	18	99.112	9.745	.097	2.203
18.5	38	118.421	11.180	.094	1.814	12	101.083	8.984	.089	2.590
19.5	14	111.857	13.491	.121	3.605	4	98.500	.....	.....	.....
20.5	15	114.800	11.000	.096	2.840	3	96.000	.....	.....	.....
Adult	9	116.000	.....	.....	.....	1	109.000	.....	.....	.....

TABLE X. AGE CHANGES IN WEIGHT (IN POUNDS), *continued.*

KOREAN

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	4	40.500	.....	.....	.....	1	35.000	.....	.....	.....
6.5	4	43.500	.....	.....	.....	4	42.000	.....	.....	.....
7.5	7	43.857	.....	.....	.....	5	45.000	.....	.....	.....
8.5	6	47.000	.....	.....	.....	4	59.250	.....	.....	.....
9.5	8	55.625	.....	.....	.....	9	55.000	.....	.....	.....
10.5	13	54.815	7.026	.128	1.948	6	64.167	.....	.....	.....
11.5	12	65.000	4.708	.072	1.359	9	67.333	.....	.....	.....
12.5	15	74.200	11.402	.154	2.944	6	75.000	.....	.....	.....
13.5	13	78.000	9.992	.128	2.771	12	87.250	10.198	.116	2.658
14.5	18	95.000	15.427	.162	3.636	10	105.800	10.296	.094	3.293
15.5	9	100.667	.....	.....	.....	22	104.409	10.890	.104	2.322
16.5	7	119.571	.....	.....	.....	9	103.222	.....	.....	.....
17.5	6	113.000	.....	.....	.....	4	107.750	.....	.....	.....
18.5	2	122.500	.....	.....	.....	....	.....	.....	.....	.....
19.5	2	116.500	.....	.....	.....	....	.....	.....	.....	.....
20.5	1	142.000	.....	.....	.....	....	.....	.....	.....	.....

NORTH EUROPEAN

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	59.000	.....	.....	.....	3	45.000	.....	.....	.....
6.5	21	47.476	5.624	.118	1.159	18	47.889	6.991	.146	1.648
7.5	34	54.206	7.510	.138	1.288	29	50.483	7.084	.140	1.315
8.5	33	56.606	7.261	.128	1.264	38	56.421	7.155	.127	1.161
9.5	49	61.673	8.218	.133	1.174	30	62.700	8.071	.129	1.474
10.5	50	65.080	9.361	.144	1.324	26	70.615	6.517	.092	1.278
11.5	37	76.676	9.558	.125	1.571	19	74.474	7.315	.098	1.678
12.5	33	82.546	11.958	.145	2.081	40	84.850	10.817	.127	1.710
13.5	37	87.027	12.961	.149	2.131	39	105.179	16.911	.161	2.708
14.5	35	105.800	12.845	.126	2.171	49	108.490	16.553	.152	2.322
15.5	38	122.395	15.427	.126	2.503	41	114.317	15.843	.138	2.474
16.5	22	131.045	13.965	.106	2.978	35	119.743	13.342	.111	2.255
17.5	17	138.882	15.843	.114	3.842	22	115.591	10.770	.093	2.362
18.5	4	137.250	.....	.....	.....	12	117.500	12.450	.106	3.594
19.5	6	148.000	.....	.....	.....	5	117.600	.....	.....	.....
20.5	4	144.750	.....	.....	.....	1	103.000	.....	.....	.....
Adult	1	136.000	.....	.....	.....	12	155.667	38.309	.246	11.059

SOUTH EUROPEAN

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	....	.....	.....	.....	.....	1	44.000	.....	.....	.....
6.5	29	44.655	4.823	.108	.896	28	41.643	5.259	.126	.994
7.5	51	46.863	5.235	.112	.733	50	44.940	4.650	.103	.658
8.5	37	50.135	5.458	.109	.897	53	49.208	4.947	.100	.679
9.5	42	54.714	6.036	.110	.899	56	54.821	8.627	.157	1.153
10.5	42	60.524	6.804	.112	1.014	51	60.863	8.084	.133	1.132
11.5	53	66.585	8.069	.121	1.108	54	66.963	8.700	.130	1.184
12.5	50	70.960	8.660	.122	1.224	62	78.081	11.747	.150	1.492
13.5	40	77.975	12.570	.161	1.987	59	89.441	11.958	.134	1.557
14.5	31	93.194	11.533	.119	2.071	51	99.000	12.369	.125	1.732
15.5	18	93.889	14.594	.155	3.439	37	99.351	12.289	.124	2.020
16.5	11	109.818	8.747	.079	2.637	23	107.869	14.867	.108	3.100
17.5	7	125.857	.....	.....	.....	17	108.412	19.334	.178	.469
18.5	3	137.000	.....	.....	.....	4	112.250	.....	.....	.....
19.5	2	132.000	.....	.....	.....	3	132.667	.....	.....	.....
20.5	1	116.000	.....	.....	.....	4	116.750	.....	.....	.....

TABLE X. AGE CHANGES IN WEIGHT (IN POUNDS), *continued.*

HAWAIIAN-ASIATIC

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	2	34.000	.....	.....	.....	1	44.000	.....	.....	.....
6.5	23	44.913	4.520	.101	.942	13	43.230	5.767	.133	1.599
7.5	33	47.394	6.203	.130	1.079	33	46.939	5.573	.119	.970
8.5	36	53.500	7.517	.140	1.252	36	54.417	7.683	.144	1.280
9.5	32	58.343	12.288	.210	2.172	42	55.881	7.534	.135	1.162
10.5	36	61.805	9.991	.161	1.665	37	64.630	10.198	.158	1.676
11.5	26	68.269	7.857	.115	1.540	25	76.200	10.149	.133	2.074
12.5	23	77.739	10.583	.136	2.206	33	84.970	13.340	.157	2.320
13.5	23	83.608	17.059	.204	3.556	29	96.725	12.369	.128	2.296
14.5	25	99.680	19.313	.193	3.862	25	103.920	12.328	.119	2.466
15.5	14	115.429	19.545	.169	5.223	17	113.530	22.891	.202	5.552
16.5	8	129.000	.....	.....	.....	25	115.920	16.462	.142	3.292
17.5	4	132.200	.....	.....	.....	12	115.083	11.576	.101	3.341
18.5	8	132.500	.....	.....	.....	9	119.340	.....	.....	.....
19.5	8	139.500	.....	.....	.....	6	129.500	.....	.....	.....

HAWAIIAN-NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	48.000	.....	.....	.....	2	47.500	.....	.....	.....
6.5	25	47.320	6.214	.131	1.243	20	48.200	4.643	.096	1.038
7.5	33	51.727	6.934	.134	1.207	35	49.200	6.436	.131	1.088
8.5	48	55.333	7.255	.131	1.047	38	54.895	6.198	.113	1.005
9.5	36	63.500	9.547	.150	1.591	47	62.766	12.649	.201	1.845
10.5	45	69.022	10.817	.156	1.613	47	72.957	14.526	.199	2.119
11.5	57	74.930	13.416	.179	1.777	54	79.426	13.229	.166	1.800
12.5	45	82.377	14.560	.176	2.170	35	93.543	23.537	.252	3.979
13.5	38	94.236	18.083	.192	2.933	52	102.135	17.692	.173	2.450
14.5	36	111.028	25.826	.233	4.304	45	109.778	16.852	.154	2.512
15.5	30	117.734	17.720	.151	3.235	50	120.740	20.928	.173	2.959
16.5	29	133.310	21.977	.165	4.081	33	123.242	14.387	.117	2.504
17.5	18	147.445	9.540	.065	2.248	30	127.100	21.354	.168	3.898
18.5	18	144.167	14.457	.100	3.407	21	120.762	16.912	.140	3.690
19.5	13	145.307	13.601	.094	3.771	10	123.200	10.677	.087	3.373

HAWAIIAN-SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	39.000	.....	.....	.....	....	.....	.....	.....	.....
6.5	8	43.250	.....	.....	.....	4	40.250	.....	.....	.....
7.5	12	48.750	5.230	.107	1.509	13	47.615	5.731	.120	1.589
8.5	19	53.105	6.867	.129	1.575	10	50.700	5.041	.099	1.594
9.5	21	60.905	5.748	.094	1.254	16	56.500	7.681	.136	1.920
10.5	16	65.375	5.819	.089	1.455	13	64.384	8.242	.128	2.285
11.5	21	79.096	17.292	.218	3.693	18	72.000	10.817	.150	2.549
12.5	12	83.083	19.596	.236	5.657	14	89.571	12.728	.142	3.401
13.5	17	84.353	18.000	.213	4.365	20	90.100	14.832	.165	3.316
14.5	6	113.660	.....	.....	.....	15	126.133	18.841	.149	4.864
15.5	10	114.200	21.166	.185	6.691	12	114.000	14.353	.127	4.143
16.5	5	115.000	.....	.....	.....	13	120.923	18.138	.150	5.029
17.5	....	.....	.....	.....	.....	4	122.000	.....	.....	.....
18.5	5	139.000	.....	.....	.....	4	115.000	.....	.....	.....

TABLE X. AGE CHANGES IN WEIGHT (IN POUNDS), *continued.*

HAWAIIAN-ASIATIC-EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	3	47.667	.....	.....	.....	3	41.660	.....	.....	.....
7.5	13	48.385	3.913	.081	1.085	16	48.187	5.992	.124	1.498
8.5	14	53.714	5.147	.096	1.375	10	55.600	6.844	.123	2.164
9.5	11	59.818	6.899	.115	2.080	9	56.333	.....	.....	.....
10.5	11	63.091	3.919	.062	1.181	15	62.933	10.440	.165	2.695
11.5	10	68.600	7.378	.107	1.333	12	77.167	15.230	.197	4.393
12.5	10	78.636	14.142	.174	4.472	11	79.363	17.292	.274	5.213
13.5	10	87.700	.....	.....	.....	10	94.800	.....	.....	.....
14.5	11	89.637	12.124	.135	3.655	13	105.615	11.916	.113	3.304
15.5	3	127.333	.....	.....	.....	14	122.920	.....	.....	.....
16.5	9	169.444	.....	.....	.....	7	119.122	.....	.....	.....
17.5	4	167.500	.....	.....	.....	9	124.770	.....	.....	.....
18.5	1	127.000	.....	.....	.....	1	124.000	.....	.....	.....
19.5	1	157.000	.....	.....	.....	3	136.333	.....	.....	.....
20.5	1	123.000	.....	.....	.....	....	.....	.....	.....	.....

TABLE XI. AGE CHANGES IN STATURE (IN CENTIMETERS)

HAWAIIAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	9	117.440	.....	.....	.....	6	115.166	.....	.....	.....
7.5	19	120.210	5.366	.045	1.231	28	118.071	5.155	.044	.974
8.5	28	123.535	4.866	.039	.919	36	126.500	7.331	.058	1.221
9.5	29	129.103	5.110	.040	.948	19	130.526	6.393	.049	1.466
10.5	39	135.076	7.155	.053	1.145	34	134.352	6.800	.051	1.166
11.5	35	139.400	5.499	.040	.929	21	141.904	5.495	.039	1.199
12.5	34	144.352	6.971	.048	1.195	31	147.290	7.244	.049	1.301
13.5	30	148.100	7.846	.053	1.448	27	149.482	6.166	.041	1.186
14.5	35	155.171	8.245	.053	1.393	33	153.242	5.862	.038	1.020
15.5	20	161.600	7.446	.046	1.665	27	156.000	4.706	.030	.905
16.5	16	165.750	5.129	.031	1.282	18	158.444	6.380	.040	1.503
17.5	10	167.800	4.445	.026	1.406	24	156.750	4.437	.028	.905
18.5	7	164.714	.....	.....	.....	12	158.417	3.730	.024	1.077
19.5	5	169.400	.....	.....	.....	9	156.222	.....	.....	.....
Adult	205	169.513	6.031	.036	.421	173	159.048	4.720	.030	.358

CHINESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	5	106.000	.....	.....	.....	9	103.889	.....	.....	.....
6.5	49	110.489	4.118	.037	.588	37	110.973	4.594	.041	.755
7.5	82	113.805	4.699	.041	.519	77	114.325	4.930	.043	.562
8.5	70	119.514	5.220	.044	.624	61	119.459	7.810	.041	.633
9.5	76	124.368	5.114	.041	.587	73	124.959	5.290	.042	.502
10.5	73	128.548	6.158	.048	.721	67	128.567	6.182	.048	.755
11.5	79	132.418	6.079	.046	.684	55	135.146	7.824	.058	1.055
12.5	57	139.561	7.290	.052	.966	67	141.209	6.337	.045	.774
13.5	66	145.939	8.111	.055	.998	55	145.927	7.580	.052	1.022
14.5	68	151.485	8.116	.054	.984	69	149.217	5.700	.038	.686
15.5	50	157.540	6.649	.042	.940	56	152.911	4.397	.028	.587
16.5	45	160.222	6.203	.039	.925	43	153.721	4.790	.031	.731
17.5	36	162.778	4.883	.030	.814	38	153.974	3.667	.024	.595
18.5	30	165.667	6.569	.040	1.199	14	153.643	5.387	.035	1.439
19.5	10	167.300	4.001	.024	1.265	8	155.750	.....	.....	.....
20.5	8	165.625	3.651	.....	.....	1	153.000	.....	.....	.....

TABLE XI. AGE CHANGES IN STATURE (IN CENTIMETERS), *continued.*

JAPANESE

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	109.000	.....	.....	.....	1	102.000	.....	.....	.....
6.5	74	109.730	4.584	.042	.533	57	109.000	3.793	.035	.502
7.5	103	114.010	5.086	.045	.501	119	112.656	5.020	.044	.460
8.5	108	118.194	5.476	.046	.527	96	116.708	5.732	.049	.491
9.5	99	122.394	4.353	.036	.437	96	122.614	6.101	.050	.693
10.5	101	126.297	5.080	.040	.505	103	126.835	6.381	.050	.629
11.5	82	129.524	5.563	.043	.614	85	131.952	7.226	.055	.783
12.5	106	135.981	6.573	.048	.638	89	139.000	6.030	.043	.639
13.5	101	141.950	7.506	.053	.747	92	144.837	5.485	.038	.572
14.5	124	148.782	7.031	.047	.631	73	147.959	4.434	.030	.519
15.5	107	156.037	5.489	.035	.531	64	148.422	4.917	.033	.615
16.5	87	157.368	6.006	.038	.644	29	151.931	4.016	.026	.746
17.5	60	159.967	5.003	.031	.646	18	150.278	5.009	.033	1.181
18.5	38	161.921	4.997	.031	.811	13	150.923	4.463	.029	1.238
19.5	15	159.533	5.378	.034	1.388	4	151.500	.....	.....	.....
20.5	15	160.000	5.459	.034	1.409	3	150.000	.....	.....	.....
Adult	10	158.100	——	.....	.....	....	.....	.....	.....	.....

KOREAN

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	4	108.750	.....	.....	.....	1	103.000	.....	.....	.....
6.5	4	116.250	.....	.....	.....	4	111.250	.....	.....	.....
7.5	7	113.430	.....	.....	.....	5	119.000	.....	.....	.....
8.5	6	120.830	.....	.....	.....	4	122.500	.....	.....	.....
9.5	8	125.375	.....	.....	.....	9	124.000	.....	.....	.....
10.5	13	126.308	5.875	.046	1.629	6	130.167	.....	.....	.....
11.5	12	134.250	3.138	.023	.906	10	136.000	4.472	.033	1.414
12.5	15	140.800	7.926	.056	2.046	6	139.667	.....	.....	.....
13.5	14	145.142	7.605	.052	2.032	12	145.417	4.406	.030	1.272
14.5	18	151.278	5.924	.039	1.396	10	150.300	3.662	.024	1.158
15.5	9	155.330	.....	.....	.....	22	151.091	4.111	.027	.876
16.5	7	162.710	.....	.....	.....	9	150.000	.....	.....	.....
17.5	6	159.000	.....	.....	.....	4	160.250	.....	.....	.....
18.5	2	162.500	.....	.....	.....	....	.....	.....	.....	.....
19.5	2	163.000	.....	.....	.....	....	.....	.....	.....	.....
20.5	1	180.000	.....	.....	.....	....	.....	.....	.....	.....
Adult	4	160.000	.....	.....	.....	....	.....	.....	.....	.....

NORTH EUROPEAN

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	126.000	.....	.....	.....	3	111.333	.....	.....	.....
6.5	21	117.952	5.627	.048	1.159	18	118.722	4.712	.040	1.110
7.5	34	123.706	4.962	.040	.851	29	122.069	4.563	.037	.847
8.5	33	128.485	6.565	.051	1.143	38	126.947	5.076	.040	.823
9.5	49	132.000	5.190	.039	.741	31	133.419	5.802	.043	1.042
10.5	50	134.620	5.560	.041	.786	28	139.536	6.489	.046	1.226
11.5	40	143.525	4.924	.034	.778	21	143.810	6.911	.048	1.508
12.5	33	147.485	6.495	.044	1.131	42	150.071	8.007	.053	1.235
13.5	37	152.919	7.943	.052	1.306	41	157.585	7.667	.049	1.197
14.5	38	162.816	7.953	.049	1.290	49	157.571	5.628	.035	.804
15.5	38	167.158	7.318	.044	1.187	42	162.239	6.362	.039	.981
16.5	23	171.609	5.799	.034	1.209	35	164.171	5.283	.032	.893
17.5	16	175.625	4.649	.026	1.162	26	163.308	5.090	.031	.998
18.5	4	178.000	.....	.....	.....	13	163.769	2.692	.016	.747
19.5	6	175.167	.....	.....	.....	5	159.200	.....	.....	.....
20.5	4	171.500	.....	.....	.....	1	165.000	.....	.....	.....
Adult	3	167.333	.....	.....	.....	12	160.583	4.716	.029	1.361

TABLE XI. AGE CHANGES IN STATURE (IN CENTIMETERS), *continued.*

SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	----	.....	.....	.....	.....	1	112.000	.....	.....	.....
6.5	29	113.965	4.749	.042	.882	28	111.500	5.322	.048	1.006
7.5	51	116.863	5.368	.046	.752	50	116.120	4.467	.038	.632
8.5	37	120.649	5.290	.044	.870	53	120.792	5.406	.045	.742
9.5	46	126.767	5.378	.042	.793	56	125.750	5.929	.047	.792
10.5	47	132.255	5.590	.042	.815	51	131.824	4.921	.037	.689
11.5	54	136.018	6.004	.044	.817	54	136.074	6.790	.050	.924
12.5	55	139.818	7.336	.052	.989	63	143.825	6.526	.045	.822
13.5	43	145.419	7.467	.051	1.139	61	149.885	5.885	.039	.753
14.5	35	151.629	7.215	.048	1.220	54	152.556	5.503	.036	.749
15.5	19	154 632	6.690	.043	1.535	40	153.625	5.523	.037	.873
16.5	12	162.500	5.204	.032	1.502	29	154.552	5.450	.035	1.012
17.5	7	164.428	.....	.....	.....	25	152.640	4.326	.028	.865
18.5	4	166.750	.....	.....	.....	8	157.000	.....	.....	.....
19.5	2	170.500	.....	.....	.....	8	159.625	.....	.....	.....
20.5	1	164.000	.....	.....	.....	4	158.125	.....	.....	.....
Adult	2	159.500	.....	.....	.....	2	163.000	.....	.....	.....

HAWAIIAN-ASIATIC

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	2	99.000	.....	.....	.....	1	115.000	.....	.....	.....
6.5	23	115.086	3.965	.034	.826	13	113.770	4.963	.044	1.376
7.5	33	117.697	5.386	.046	.937	33	117.061	4.234	.036	.737
8.5	36	121.500	5.972	.049	.995	38	123.553	5.780	.047	.937
9.5	32	127.375	7.589	.060	1.341	42	126.572	5.852	.046	.903
10.5	39	130.769	5.977	.046	.957	37	132.352	7.104	.054	1.167
11.5	26	136.231	5.272	.039	1.033	25	140.640	7.138	.051	1.428
12.5	24	142.291	5.778	.041	1.179	32	145.062	7.238	.050	1.279
13.5	23	145.652	7.927	.054	1.652	33	150.757	4.612	.031	.803
14.5	27	154.259	8.622	.056	1.659	28	153.000	5.568	.036	1.052
15.5	17	159.764	7.068	.044	1.714	21	155.238	6.331	.041	1.381
16.5	8	163.000	.....	.....	.....	30	155.900	4.556	.029	.832
17.5	7	166.400	.....	.....	.....	15	156.133	3.570	.023	.922
18.5	8	166.300	.....	.....	.....	15	156.933	7.497	.048	1.936
19.5	8	166.500	.....	.....	.....	8	159.500	.....	.....	.....
Adult	32	167.468	4.160	.025	.735	29	157.310	4.610	.029	.856

HAWAIIAN-NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	116.000	.....	.....	.....	2	115.500	.....	.....	.....
6.5	25	117.080	6.125	.052	1.225	20	117.850	5.189	.044	1.160
7.5	33	121.273	5.059	.042	.881	36	120.556	5.694	.047	.949
8.5	48	125.521	5.905	.047	.852	38	125.789	5.483	.044	.889
9.5	35	131.657	6.315	.048	1.067	47	130.107	5.814	.045	.848
10.5	45	135.311	5.453	.040	.813	47	137.979	7.135	.052	1.041
11.5	57	139.474	6.099	.044	.808	54	142.556	5.971	.042	.813
12.5	47	144.979	6.495	.045	.947	35	148.943	6.770	.045	1.144
13.5	41	150.658	8.487	.056	1.325	57	152.474	6.159	.040	.816
14.5	40	157.075	8.982	.057	1.420	50	157.100	6.027	.038	.852
15.5	31	163.581	7.147	.044	1.283	53	157.925	5.205	.033	.715
16.5	31	168.065	6.933	.041	1.245	38	159.921	5.460	.034	.886
17.5	19	173.737	6.365	.037	1.460	36	159.306	5.174	.032	.862
18.5	18	170.389	5.407	.032	1.274	25	160.080	4.595	.029	.919
19.5	13	169.769	3.165	.019	.877	13	160.385	4.217	.026	1.169
Adult	70	171.214	6.805	.040	.813	78	159.410	5.127	.032	.581

TABLE XI. AGE CHANGES IN STATURE (IN CENTIMETERS), *continued.*

HAWAIIAN-SOUTH EUROPEAN

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	111.000	.....	.....	.....	....	.....	.....	.....	.....
6.5	8	114.250	.....	.....	.....	4	112.500	.....	.....	.....
7.5	12	118.667	3.350	.028	.967	13	117.154	4.417	.038	1.224
8.5	19	123.263	5.359	.043	1.229	10	120.400	4.030	.034	1.316
9.5	21	128.714	5.248	.041	1.145	16	126.812	6.327	.050	1.582
10.5	16	133.500	4.093	.031	1.023	13	132.000	6.076	.046	1.684
11.5	21	141.143	6.468	.046	1.411	18	138.778	6.206	.045	1.462
12.5	12	144.333	7.641	.053	2.205	14	148.000	5.594	.038	1.494
13.5	18	147.056	8.141	.055	1.918	20	147.050	5.554	.038	1.241
14.5	7	156.428	.....	.....	.....	16	154.875	5.533	.036	1.383
15.5	12	156.917	8.930	.057	2.577	12	154.583	7.193	.047	2.076
16.5	5	164.600	.....	.....	.....	15	156.933	5.531	.035	1.428
17.5	3	169.000	.....	.....	.....	9	159.444	.....	.....	.....
18.5	5	169.200	.....	.....	.....	9	156.667	.....	.....	.....
Adult	19	169.789	7.208	.042	1.653	....	.....	.....	.....	.....

HAWAIIAN-ASIATIC-EUROPEAN

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	3	117.667	.....	.....	.....	3	111.660	.....	.....	.....
7.5	13	119.615	3.774	.032	1.046	16	118.688	3.636	.031	.909
8.5	14	123.714	4.787	.039	1.279	10	124.500	2.291	.018	.724
9.5	11	128.273	4.769	.037	1.438	9	129.000	.....	.....	.....
10.5	11	134.455	3.145	.023	.948	15	132.333	6.084	.046	1.571
11.5	11	140.364	8.377	.060	2.525	12	139.500	6.589	.047	1.902
12.5	11	143.818	7.918	.055	2.387	12	145.667	5.406	.037	1.561
13.5	11	149.454	8.511	.050	2.579	10	151.800	6.493	.043	2.053
14.5	12	153.500	9.069	.059	2.618	16	151.750	4.776	.031	1.194
15.5	4	164.000	.....	.....	.....	17	154.471	6.783	.044	1.645
16.5	9	169.444	.....	.....	.....	10	156.800	6.193	.039	1.958
17.5	4	167.500	.....	.....	.....	10	158.900	3.448	.021	1.090
18.5	1	161.000	.....	.....	.....	2	162.000	.....	.....	.....
19.5	1	171.000	.....	.....	.....	3	167.667	.....	.....	.....
20.5	1	157.000	.....	.....	.....	1	153.000	.....	.....	.....
Adult	....	.....	.....	.....	.....	4	164.250	.....	.....	.....

TABLE XII. AGE CHANGES IN SPAN (IN CENTIMETERS)

HAWAIIAN

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	9	116.880	.....	.....	.....	6	113.500	.....	.....	.....
7.5	19	119.842	6.991	.058	1.603	28	115.893	5.690	.049	1.075
8.5	28	123.928	5.751	.046	1.086	36	125.472	8.620	.069	2.873
9.5	29	129.551	6.647	.051	1.234	18	129.500	7.205	.056	1.698
10.5	37	135.702	7.253	.053	1.192	35	134.715	7.458	.055	1.260
11.5	34	140.736	6.414	.046	1.099	21	141.762	6.988	.049	1.525
12.5	27	147.149	6.270	.043	1.206	31	148.451	7.758	.052	1.393
13.5	22	151.636	8.911	.059	1.900	25	151.000	6.858	.045	1.377
14.5	31	160.419	9.129	.057	1.639	30	155.167	7.525	.048	1.373
15.5	18	167.388	6.183	.037	1.457	23	158.696	6.356	.040	1.325
16.5	11	171.363	.....	.....	.....	14	160.571	8.365	.052	2.235
17.5	8	173.625	.....	.....	.....	18	160.444	5.025	.031	1.184
18.5	5	175.800	.....	.....	.....	10	158.200	.....	.....	.....
19.5	4	174.500	.....	.....	.....	6	158.333	.....	.....	.....
Adult	156	176.783	7.558	.043	.605	137	161.824	5.762	.036	4.92

TABLE XII. AGE CHANGES IN SPAN (IN CENTIMETERS), *continued*

CHINESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	5	103.600	.....	.....	.....	9	101.555	.....	.....	.....
6.5	49	108.918	5.454	.050	.779	37	108.649	4.889	.045	.804
7.5	82	112.158	5.595	.050	.618	77	111.727	5.488	.049	.625
8.5	70	118.086	6.324	.053	.756	61	117.082	5.230	.045	.670
9.5	76	123.487	6.254	.051	.717	73	122.617	6.063	.049	.710
10.5	72	126.945	5.730	.045	.678	67	127.507	6.736	.053	.823
11.5	79	132.392	7.526	.057	.847	55	133.582	9.192	.069	1.239
12.5	55	139.927	7.367	.053	.993	67	140.985	6.940	.049	.848
13.5	65	147.708	7.734	.052	.897	55	146.291	9.050	.062	1.220
14.5	66	154.015	9.443	.061	1.162	69	149.667	6.955	.046	.837
15.5	50	161.120	8.246	.051	1.166	56	153.786	6.275	.041	.838
16.5	45	162.200	6.914	.043	1.031	43	153.884	6.270	.041	.956
17.5	36	165.472	6.300	.038	1.050	38	154.842	5.537	.036	.898
18.5	30	169.300	6.909	.041	1.261	14	155.786	6.635	.042	1.773
19.5	10	171.800	3.789	.022	1.198	7	155.714	.....	.....	.....
20.5	8	167.625	.....	.....	.....	1	157.000	.....	.....	.....

JAPANESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	105.000	.....	.....	.....	1	111.000	.....	.....	.....
6.5	74	107.176	5.367	.050	.624	57	106.035	4.171	.039	.552
7.5	104	111.702	5.657	.051	.555	119	109.454	5.359	.049	.491
8.5	108	115.639	5.849	.051	.563	96	113.458	6.281	.055	.641
9.5	99	121.243	5.187	.043	.521	96	119.698	6.674	.056	.681
10.5	101	124.743	5.999	.048	.597	103	124.660	7.015	.056	.691
11.5	82	129.639	6.602	.051	.729	85	130.082	7.781	.060	.844
12.5	106	135.283	7.622	.056	.740	89	138.213	6.750	.049	.715
13.5	100	142.420	8.615	.060	.862	91	143.483	6.111	.042	.641
14.5	123	149.724	8.279	.055	.746	73	147.425	4.817	.033	.564
15.5	107	157.271	6.325	.040	.611	63	148.143	6.737	.045	.849
16.5	84	159.607	7.277	.046	.794	29	152.690	5.931	.039	1.101
17.5	60	162.383	6.411	.039	.828	18	149.945	7.288	.049	1.718
18.5	38	164.211	6.956	.042	1.128	13	150.462	5.514	.037	1.529
19.5	14	163.643	5.863	.036	1.567	4	149.500	.....	.....	.....
20.5	15	162.133	5.488	.034	1.417	3	149.000	.....	.....	.....
Adult	9	159.440	.....	.....	.....	1	152.000	.....	.....	.....

KOREAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	4	107.000	.....	.....	.....	1	99.000	.....	.....	.....
6.5	4	112.750	.....	.....	.....	1	109.000	.....	.....	.....
7.5	7	110.428	.....	.....	.....	5	116.000	.....	.....	.....
8.5	6	119.330	.....	.....	.....	4	119.000	.....	.....	.....
9.5	8	122.875	.....	.....	.....	9	122.111	.....	.....	.....
10.5	13	123.692	6.419	.052	1.780	6	127.167	.....	.....	.....
11.5	12	131.750	4.002	.030	1.155	10	138.200	6.079	.044	1.922
12.5	15	139.467	9.003	.064	2.324	6	138.167	.....	.....	.....
13.5	14	144.714	9.019	.062	2.410	12	145.083	6.474	.045	1.869
14.5	18	152.000	8.205	.054	1.934	11	150.363	5.637	.037	1.699
15.5	9	156.220	.....	.....	.....	22	150.318	5.779	.038	1.232
16.5	7	159.271	.....	.....	.....	9	150.555	.....	.....	.....
17.5	6	163.160	.....	.....	.....	4	159.750	.....	.....	.....
18.5	2	165.000	.....	.....	.....	....	.....	.....	.....	.....
19.5	2	166.000	.....	.....	.....	....	.....	.....	.....	.....
20.5	1	182.000	.....	.....	.....	....	.....	.....	.....	.....

TABLE XII. AGE CHANGES IN SPAN (IN CENTIMETERS), *continued*

NORTH EUROPEAN

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	126.000	.....	.....	.....	3	107.000	.....	.....	.....
6.5	21	115.905	5.639	.049	1.230	18	114.889	5.098	.044	1.201
7.5	34	122.941	5.514	.045	.946	29	119.379	6.275	.053	1.165
8.5	32	127.281	6.856	.054	1.212	38	125.210	5.754	.046	.933
9.5	49	131.102	5.776	.044	.825	31	131.613	6.573	.050	1.180
10.5	50	135.620	6.615	.049	.935	28	138.857	8.249	.059	1.559
11.5	40	145.050	5.835	.040	.922	22	145.273	8.534	.059	1.820
12.5	33	148.424	8.312	.056	1.447	42	150.810	8.778	.058	1.354
13.5	37	155.189	9.792	.063	1.610	41	157.415	8.059	.051	1.258
14.5	38	165.947	10.583	.064	1.717	49	157.979	7.127	.045	1.018
15.5	38	171.342	8.043	.047	1.305	41	161.171	7.241	.045	1.131
16.5	23	175.957	6.464	.037	1.348	33	163.515	6.434	.039	1.120
17.5	17	178.412	6.126	.034	1.486	26	163.346	5.441	.033	1.067
18.5	4	178.750	.....	.....	.....	12	164.083	4.907	.030	1.416
19.5	6	180.000	.....	.....	.....	5	159.400	.....	.....	.....
20.5	4	176.000	.....	.....	.....	1	166.000	.....	.....	.....
Adult	3	173.333	.....	.....	.....	12	160.917	7.205	.045	2.080

SOUTH EUROPEAN

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	....	.....	.....	.....	.....	1	109.000	.....	.....	.....
6.5	29	112.345	5.782	.051	1.074	28	108.571	5.723	.053	1.081
7.5	51	115.765	6.179	.053	.865	50	113.500	5.072	.045	.717
8.5	37	121.216	6.423	.053	1.056	53	118.415	5.119	.043	.703
9.5	42	126.310	6.606	.052	.985	55	123.945	6.684	.054	.901
10.5	46	132.065	6.732	.051	.993	51	131.039	6.174	.047	.864
11.5	53	136.887	7.115	.052	.977	54	135.833	7.878	.058	1.072
12.5	51	141.412	7.946	.056	1.112	62	144.323	7.892	.055	1.002
13.5	41	145.415	9.549	.066	1.491	60	150.500	7.143	.047	.922
14.5	31	156.097	9.593	.061	1.723	51	153.392	6.791	.044	.951
15.5	18	159.055	8.093	.051	1.907	38	154.711	6.593	.043	1.069
16.5	12	169.084	5.838	.035	1.685	25	157.040	7.080	.045	1.416
17.5	7	167.857	.....	.....	.....	18	155.611	5.251	.034	1.237
18.5	3	173.333	.....	.....	.....	5	157.200	.....	.....	.....
19.5	2	169.500	.....	.....	.....	3	165.000	.....	.....	.....
20.5	1	169.000	.....	.....	.....	4	159.250	.....	.....	.....

HAWAIIAN-ASIATIC

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	2	96.500	.....	.....	.....	1	112.000	.....	.....	.....
6.5	23	114.782	5.650	.049	1.178	13	113.539	6.110	.054	.169
7.5	34	116.824	6.007	.051	1.030	33	116.090	5.749	.050	1.000
8.5	36	121.916	6.034	.049	1.005	36	122.027	6.805	.056	1.134
9.5	32	128.000	8.642	.068	1.527	42	125.452	6.437	.051	.993
10.5	37	132.027	7.153	.054	1.175	37	131.243	7.820	.060	1.285
11.5	26	137.693	6.562	.048	1.286	25	141.160	8.465	.060	1.693
12.5	24	144.458	5.838	.040	1.191	32	145.906	8.889	.061	1.571
13.5	23	148.565	10.344	.070	2.156	32	153.344	4.320	.028	.764
14.5	26	157.615	10.344	.066	2.028	28	156.107	5.969	.038	1.128
15.5	15	164.600	9.265	.056	2.392	18	158.500	8.532	.054	2.010
16.5	8	169.750	.....	.....	.....	26	158.269	4.663	.030	.914
17.5	5	170.600	.....	.....	.....	13	159.308	5.119	.032	1.412
18.5	8	171.400	.....	.....	.....	11	163.454	5.582	.034	1.683
19.5	8	171.750	.....	.....	.....	6	163.160	.....	.....	.....
Adult	27	173.407	5.202	.030	1.001	27	160.408	6.580	.041	1.266

TABLE XII. AGE CHANGES IN SPAN (IN CENTIMETERS), *continued*

HAWAIIAN-NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	119.000	.....	.....	.....	2	113.500	.....	.....	.....
6.5	25	115.800	6.306	.055	1.261	20	116.450	5.436	.047	1.216
7.5	33	121.212	4.996	.041	.870	36	118.722	6.063	.051	1.011
8.5	48	125.021	6.771	.054	.977	38	124.579	6.172	.049	1.001
9.5	36	132.167	6.793	.051	1.132	47	128.783	6.474	.050	.944
10.5	45	135.689	6.175	.046	.921	47	137.404	7.938	.058	1.158
11.5	56	140.393	6.586	.047	.880	54	143.074	7.786	.054	1.059
12.5	44	147.114	7.897	.054	1.190	34	149.765	7.276	.049	1.248
13.5	40	154.075	10.148	.066	1.604	56	154.464	7.063	.046	.944
14.5	36	161.888	10.817	.067	1.802	49	158.184	7.221	.046	1.032
15.5	31	168.419	8.103	.048	1.455	51	160.569	6.690	.042	.937
16.5	29	173.793	7.748	.045	1.438	36	162.611	5.712	.035	.952
17.5	18	180.611	6.684	.037	1.575	33	161.333	7.134	.044	1.242
18.5	18	175.666	6.009	.034	1.416	21	161.524	4.737	.029	1.034
19.5	13	175.000	3.637	.021	1.008	12	162.333	6.060	.037	1.749
Adult	53	178.698	7.043	.039	.967	73	161.521	6.944	.043	.813

HAWAIIAN-SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	105.000	.....	.....	.....	....	.....	.....	.....	.....
6.5	6	112.500	.....	.....	.....	4	110.000	.....	.....	.....
7.5	12	118.000	4.618	.039	1.333	13	115.846	5.895	.051	1.634
8.5	19	123.947	7.402	.060	1.698	10	120.100	4.928	.041	1.558
9.5	21	129.952	5.851	.045	1.276	16	125.250	6.685	.053	1.671
10.5	16	135.188	5.399	.040	1.349	13	133.231	6.053	.045	1.678
11.5	21	143.429	6.933	.048	1.513	18	139.222	6.294	.045	1.483
12.5	12	145.666	8.469	.058	2.444	14	149.285	7.601	.051	2.031
13.5	17	151.059	9.110	.060	2.209	19	149.369	5.941	.040	1.362
14.5	6	160.833	.....	.....	.....	16	158.125	8.022	.051	2.006
15.5	10	164.400	8.754	.053	2.767	12	156.333	8.976	.057	2.591
16.5	5	167.250	.....	.....	.....	14	159.858	7.680	.048	2.052
17.5	2	172.500	.....	.....	.....	5	158.000	.....	.....	.....
18.5	5	173.200	.....	.....	.....	4	164.750	.....	.....	.....
Adult	14	175.358	8.329	.047	2.225	....	.....	.....	.....	.....

HAWAIIAN-ASIATIC-EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	3	118.333	.....	.....	.....	3	108.660	.....	.....	.....
7.5	13	118.615	5.241	.044	1.453	16	117.625	4.491	.038	1.123
8.5	14	123.714	6.318	.051	1.688	10	122.000	3.742	.031	1.183
9.5	11	128.273	5.378	.042	1.621	9	127.222	.....	.....	.....
10.5	11	135.273	4.201	.031	1.267	15	132.333	7.507	.057	1.938
11.5	11	142.091	7.229	.051	2.179	12	140.083	7.228	.052	2.087
12.5	11	146.273	8.719	.060	2.628	11	147.000	5.274	.036	1.590
13.5	10	150.500	12.806	.085	4.049	10	152.000	7.950	.052	2.514
14.5	12	158.083	10.724	.068	3.095	14	153.429	8.261	.054	2.208
15.5	3	167.667	.....	.....	.....	14	157.357	7.048	.045	1.883
16.5	9	174.667	.....	.....	.....	8	159.500	.....	.....	.....
17.5	4	173.750	.....	.....	.....	9	160.778	.....	.....	.....
18.5	1	164.000	.....	.....	.....	1	170.000	.....	.....	.....
19.5	1	176.000	.....	.....	.....	3	173.000	.....	.....	.....
20.5	1	158.000	.....	.....	.....	1	153.000	.....	.....	.....
Adult	....	.....	.....	.....	.....	4	163.750	.....	.....	.....

TABLE XIII. AGE CHANGES IN RELATIVE SPAN

HAWAIIAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	9	99.550	.....	.....	.....	6	98.500	.....	.....	.....
7.5	19	99.685	2.555	.026	.586	28	98.107	1.897	.019	.358
8.5	28	100.214	1.916	.019	.362	36	99.111	1.970	.020	.328
9.5	29	100.345	2.186	.022	.406	18	99.388	1.918	.019	.452
10.5	37	100.622	2.044	.020	.336	34	100.059	2.086	.021	.035
11.5	34	100.853	1.556	.015	.266	21	99.809	2.218	.022	.484
12.5	26	101.847	2.267	.022	.445	31	100.742	1.703	.017	.305
13.5	22	102.136	2.159	.021	.460	25	100.640	2.651	.026	.530
14.5	31	102.774	1.844	.018	.331	30	101.500	2.140	.021	.390
15.5	17	102.765	1.435	.014	.348	22	101.227	2.214	.022	.472
16.5	10	104.300	1.735	.017	.549	13	100.923	1.939	.019	.537
17.5	8	103.500	.....	.....	.....	15	101.667	2.358	.023	.608
18.5	5	105.400	.....	.....	.....	10	100.000	.....	.....	.....
19.5	4	104.250	.....	.....	.....	5	101.400	.....	.....	.....
Adult	145	104.344	2.396	.023	.198	128	101.805	2.352	.023	.207

CHINESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	5	97.600	.....	.....	.....	9	97.667	.....	.....	.....
6.5	49	98.531	2.963	.030	.427	37	97.784	2.170	.022	.357
7.5	81	98.284	2.195	.022	.244	77	97.519	1.939	.020	.221
8.5	70	98.672	2.623	.026	.313	61	97.934	2.166	.022	.277
9.5	76	99.263	2.198	.022	.252	73	98.082	2.398	.024	.281
10.5	73	99.082	2.149	.022	.252	67	99.089	2.071	.021	.253
11.5	79	99.874	2.274	.023	.256	55	98.636	2.400	.024	.324
12.5	56	100.536	2.368	.023	.316	67	99.806	2.098	.021	.256
13.5	66	100.788	1.980	.020	.244	55	100.164	2.317	.023	.312
14.5	66	101.424	2.269	.022	.279	69	100.261	2.296	.023	.276
15.5	50	102.120	2.544	.025	.360	53	100.340	2.283	.023	.314
16.5	45	101.222	1.811	.018	.270	43	100.047	2.302	.023	.351
17.5	36	101.667	1.780	.017	.297	38	100.474	2.256	.022	.366
18.5	30	102.000	2.280	.022	.416	14	100.357	1.836	.018	.491
19.5	10	102.600	2.154	.021	.681	7	100.000	.....	.....	.....
20.5	8	101.875	.....	.....	.....	1	102.600	.....	.....	.....

JAPANESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	74	97.527	1.954	.020	.227	57	97.000	3.217	.033	.426
7.5	104	97.894	2.252	.023	.221	119	97.059	2.313	.024	.212
8.5	108	97.648	2.408	.025	.232	96	97.094	2.354	.024	.240
9.5	99	98.899	2.168	.022	.218	96	97.542	2.236	.023	.228
10.5	101	98.594	2.238	.023	.223	103	98.165	2.145	.022	.211
11.5	82	99.158	2.121	.021	.234	85	98.682	2.302	.023	.250
12.5	106	99.207	2.074	.021	.201	89	99.315	2.030	.020	.215
13.5	99	100.323	2.419	.024	.243	92	98.848	2.449	.025	.255
14.5	123	100.471	2.076	.021	.187	73	99.589	1.694	.017	.198
15.5	107	100.832	1.910	.019	.185	63	99.698	2.567	.026	.323
16.5	87	101.563	2.472	.024	.268	29	100.414	2.328	.023	.432
17.5	60	101.467	2.349	.023	.303	18	99.667	2.472	.025	.583
18.5	38	101.342	2.451	.024	.398	12	99.833	2.114	.021	.610
19.5	14	102.428	1.761	.017	.471	4	98.650	.....	.....	.....
20.5	15	101.400	2.245	.022	.580	3	99.333	.....	.....	.....
Adult	9	101.000	.....	.....	.....	1	99.350	.....	.....	.....

TABLE XIII. AGE CHANGES IN RELATIVE SPAN, *continued*

KOREAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	4	98.420	.....	.....	.....	1	96.120	.....	.....	.....
6.5	4	96.992	.....	.....	.....	4	97.960	.....	.....	.....
7.5	7	97.343	.....	.....	.....	5	97.474	.....	.....	.....
8.5	6	98.733	.....	.....	.....	4	97.145	.....	.....	.....
9.5	8	98.115	.....	.....	.....	9	98.473	.....	.....	.....
10.5	13	98.308	2.198	.022	.610	6	97.650	.....	.....	.....
11.5	13	98.231	1.578	.016	.438	10	99.500	1.628	.016	.515
12.5	15	99.067	1.844	.019	.476	6	98.910	.....	.....	.....
13.5	14	99.714	1.830	.018	.489	12	99.500	1.980	.020	.572
14.5	18	100.389	2.241	.022	.528	10	99.600	1.800	.018	.569
15.5	9	100.516	.....	.....	.....	22	99.409	2.674	.027	.570
16.5	7	100.883	.....	.....	.....	9	100.366	.....	.....	.....
17.5	6	102.650	.....	.....	.....	4	99.663	.....	.....	.....
18.5	2	101.515	.....	.....	.....					
19.5	2	101.850	.....	.....	.....					

NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	100.000	.....	.....	.....	3	96.100	.....	.....	.....
6.5	21	98.238	2.135	.022	.466	18	96.833	1.709	.018	.403
7.5	34	99.647	1.997	.020	.342	29	98.069	2.133	.022	.396
8.5	32	99.094	2.037	.021	.360	38	98.895	1.970	.020	.320
9.5	49	99.347	2.254	.023	.322	31	98.774	2.074	.021	.372
10.5	50	100.760	1.679	.017	.237	28	98.893	2.678	.027	.506
11.5	40	101.200	1.749	.017	.277	22	100.318	1.661	.017	.354
12.5	33	100.545	2.375	.024	.413	41	100.537	2.086	.021	.326
13.5	37	101.405	2.247	.022	.369	41	99.976	2.665	.027	.416
14.5	37	101.595	2.236	.022	.368	49	100.163	2.644	.026	.378
15.5	38	102.263	2.302	.023	.373	41	99.415	2.400	.024	.375
16.5	23	102.565	1.715	.017	.358	33	99.606	2.296	.023	.400
17.5	16	102.000	2.784	.027	.696	26	100.077	2.631	.026	.516
18.5	4	100.425	.....	.....	.....	12	100.333	1.887	.019	.545
19.5	6	102.767	.....	.....	.....	5	100.200	.....	.....	.....
20.5	4	102.675	.....	.....	.....	1	100.600	.....	.....	.....
Adult	3	103.567	.....	.....	.....	12	100.250	2.241	.022	.647

SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	....	.....	.....	.....	.....	1	97.320	.....	.....	.....
6.5	29	98.379	3.231	.033	.600	28	97.464	2.352	.024	.444
7.5	52	99.115	2.191	.022	.304	50	97.580	1.949	.020	.276
8.5	37	99.486	2.249	.023	.370	53	98.000	2.074	.021	.285
9.5	42	99.429	2.258	.023	.348	55	98.636	2.100	.022	.283
10.5	46	99.913	2.358	.024	.348	51	99.333	2.349	.024	.329
11.5	53	100.547	1.929	.019	.265	54	99.796	2.256	.023	.307
12.5	51	100.902	2.293	.023	.321	62	100.403	2.276	.023	.289
13.5	40	100.975	2.241	.022	.354	60	100.417	2.093	.021	.270
14.5	31	102.387	2.498	.024	.449	52	100.212	2.733	.027	.379
15.5	18	102.500	1.892	.018	.446	38	100.921	2.298	.023	.373
16.5	12	104.000	1.225	.118	.354	25	100.560	3.022	.030	.604
17.5	7	102.143	.....	.....	.....	18	101.944	2.528	.025	.596
18.5	3	102.760	.....	.....	.....	5	101.188	.....	.....	.....
19.5	2	102.330	.....	.....	.....	3	100.600	.....	.....	.....
20.5	1	103.050	.....	.....	.....	4	100.610	.....	.....	.....

TABLE XIII. AGE CHANGES IN RELATIVE SPAN, *continued*

HAWAIIAN-ASIATIC

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	2	97.950	.....	.....	.....	1	97.400	.....	.....	.....
6.5	23	99.565	2.392	.024	.498	13	99.693	2.051	.021	.569
7.5	33	99.303	1.849	.019	.321	33	98.970	2.492	.025	.434
8.5	36	100.000	2.054	.020	.342	36	98.722	2.455	.025	.409
9.5	32	100.500	2.668	.026	.470	42	99.000	2.224	.022	.343
10.5	37	100.946	2.229	.022	.366	37	99.216	2.119	.021	.348
11.5	26	101.038	2.193	.022	.430	25	100.360	2.095	.021	.419
12.5	24	101.541	1.957	.019	.399	31	100.161	2.678	.027	.481
13.5	22	102.000	2.907	.028	.620	33	101.212	2.408	.024	.419
14.5	26	102.000	1.466	.014	.287	28	102.071	2.052	.020	.388
15.5	15	102.933	2.839	.028	.733	18	101.667	2.027	.020	.478
16.5	8	104.000	.....	.....	.....	26	101.154	1.634	.016	.320
17.5	5	102.600	.....	.....	.....	13	102.000	1.414	.014	.392
18.5	8	102.780	.....	.....	.....	10	102.200	.....	.....	.....
19.5	8	103.160	.....	.....	.....	5	101.754	.....	.....	.....
Adult	26	103.384	2.002	.019	.392	23	102.130	1.871	.018	.390

HAWAIIAN-NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	102.600	.....	.....	.....	2	98.250	.....	.....	.....
6.5	25	98.800	1.980	.020	.396	20	98.800	2.135	.022	.477
7.5	33	99.848	2.105	.021	.366	36	98.417	1.977	.020	.330
8.5	48	99.562	1.857	.019	.268	38	99.000	2.328	.024	.378
9.5	35	100.086	2.234	.022	.378	47	99.000	2.184	.022	.319
10.5	45	100.333	1.738	.017	.259	47	99.596	2.247	.023	.328
11.5	56	100.607	2.093	.021	.280	54	100.370	2.337	.023	.318
12.5	44	101.454	2.417	.024	.364	34	100.412	2.302	.023	.395
13.5	40	102.225	1.903	.019	.301	56	101.214	2.225	.022	.297
14.5	36	102.667	2.322	.023	.387	49	100.714	2.156	.021	.308
15.5	31	102.871	2.045	.020	.367	51	101.549	2.322	.023	.325
16.5	29	103.207	1.828	.018	.339	36	101.556	1.833	.018	.306
17.5	18	103.667	2.516	.024	.593	32	100.875	2.559	.025	.452
18.5	18	103.167	2.267	.022	.534	21	100.762	2.307	.023	.503
19.5	13	103.077	2.057	.020	.570	12	100.833	2.267	.022	.654
Adult	51	104.196	1.980	.019	.277	71	101.394	2.604	.026	.309

HAWAIIAN-SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	94.600	.....	.....	.....	....	.....	.....	.....	.....
6.5	8	98.587	.....	.....	.....	4	97.770	.....	.....	.....
7.5	12	99.083	2.140	.022	.618	13	98.923	2.093	.021	.580
8.5	19	100.474	2.302	.023	.528	10	100.000	2.324	.023	.734
9.5	21	101.000	2.309	.023	.504	16	98.750	2.107	.021	.527
10.5	16	101.250	2.512	.025	.628	13	101.000	2.111	.021	.585
11.5	21	101.572	1.789	.018	.390	18	100.389	2.032	.020	.478
12.5	12	101.000	2.769	.027	.799	14	100.929	2.375	.024	.634
13.5	17	102.765	1.353	.013	.328	19	101.632	2.032	.020	.466
14.5	6	101.150	.....	.....	.....	13	101.308	2.812	.028	.779
15.5	10	103.500	2.110	.020	.667	12	101.583	4.072	.040	1.176
16.5	5	100.750	.....	.....	.....	14	101.857	1.808	.020	.483
17.5	2	103.000	.....	.....	.....	5	100.054	.....	.....	.....
18.5	5	102.328	.....	.....	.....	4	103.935	.....	.....	.....
Adult	13	104.539	1.985	.019	.550					

TABLE XIII. AGE CHANGES IN RELATIVE SPAN, *continued*

HAWAIIAN-ASIATIC-EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	3	100.433	.....	.....	.....	3	97.166	.....	.....	.....
7.5	13	99.077	2.200	.022	.610	16	99.125	1.900	.019	.475
8.5	14	99.929	2.520	.025	.673	10	97.900	1.578	.016	.499
9.5	11	100.000	1.758	.017	.530	9	98.633	.....	.....	.....
10.5	11	100.636	2.267	.022	.683	15	99.867	1.407	.014	.363
11.5	11	101.182	1.992	.019	.601	12	100.417	1.552	.015	.448
12.5	11	102.091	1.929	.019	.582	11	100.727	2.135	.021	.644
13.5	10	100.300	2.147	.021	.679	10	100.100	2.022	.020	.639
14.5	12	102.417	1.847	.018	.533	14	100.429	2.691	.027	.719
15.5	3	101.877	.....	.....	.....	13	101.385	1.497	.015	.415
16.5	9	102.767	.....	.....	.....	8	100.875	.....	.....	.....
17.5	4	103.750	.....	.....	.....	9	100.889	2.470	.024	.823
18.5	1	101.900	.....	.....	.....	.....	.....	.....	.....	.....
19.5	1	102.900	.....	.....	.....	2	101.170	.....	.....	.....
Adult	1	100.600	.....	.....	.....	5	100.260	.....	.....	.....

TABLE XIV. AGE CHANGES IN SITTING HEIGHT (IN CENTIMETERS)

HAWAIIAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	9	64.110	.....	.....	.....	6	62.166	.....	.....	.....
7.5	19	64.895	2.731	.042	.626	28	64.322	2.406	.037	.454
8.5	28	66.893	2.304	.034	.435	36	68.056	3.792	.056	.632
9.5	29	69.448	2.514	.036	.466	18	69.945	3.732	.053	.879
10.5	37	71.594	3.165	.044	.520	35	71.514	3.046	.042	.514
11.5	34	73.117	3.341	.046	.572	20	75.050	2.617	.035	.585
12.5	27	75.592	2.778	.037	.534	29	76.689	3.504	.046	.650
13.5	21	76.428	3.017	.039	.658	24	79.083	3.253	.041	.664
14.5	31	80.967	3.685	.046	.661	26	80.346	3.573	.044	.700
15.5	16	84.250	3.881	.046	.970	19	82.527	3.266	.040	.749
16.5	7	85.857	.....	.....	.....	12	83.167	2.823	.034	.814
17.5	5	86.200	.....	.....	.....	14	82.858	2.474	.030	.661
18.5	3	85.666	.....	.....	.....	8	84.875	.....	.....	.....
19.5	3	87.000	.....	.....	.....	3	84.333	.....	.....	.....

CHINESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	5	57.800	.....	.....	.....	9	57.333	1.292	.022	.431
6.5	49	60.776	2.998	.049	.428	37	60.568	2.387	.039	.392
7.5	82	62.122	2.356	.038	.260	77	62.403	2.650	.042	.302
8.5	70	65.071	2.636	.041	.315	61	64.295	2.778	.043	.356
9.5	76	66.711	2.588	.039	.297	73	66.630	2.802	.042	.328
10.5	73	68.644	3.253	.047	.381	67	68.224	3.458	.051	.422
11.5	79	69.836	2.978	.043	.335	55	71.182	4.194	.059	.565
12.5	56	72.839	3.604	.049	.482	67	74.239	3.351	.045	.409
13.5	66	75.939	4.400	.058	.542	55	76.418	3.793	.049	.511
14.5	67	78.687	4.735	.060	.578	69	78.246	2.985	.038	.359
15.5	50	82.380	3.826	.046	.541	56	80.571	2.764	.034	.369
16.5	45	84.089	4.152	.049	.619	43	81.372	2.746	.034	.419
17.5	36	84.361	3.309	.039	.552	38	82.184	2.010	.024	.326
18.5	30	86.833	3.742	.043	.683	14	81.643	1.913	.023	.511
19.5	10	88.000	.....	.....	.....	7	82.850	.....	.....	.....
20.5	8	88.500	.....	.....	.....	1	83.000	.....	.....	.....

TABLE XIV. AGE CHANGES IN SITTING HEIGHT (IN CENTIMETERS) *continued*

JAPANESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	61.000	.....	.....	.....	1	60.000	.....	.....	.....
6.5	74	60.797	2.655	.044	.309	57	60.649	2.557	.037	.338
7.5	104	62.731	2.898	.046	.284	119	62.034	2.596	.042	.238
8.5	108	65.250	2.897	.044	.279	96	63.886	3.111	.049	.317
9.5	99	66.626	2.315	.035	.245	96	66.510	3.329	.050	.340
10.5	102	68.304	2.835	.042	.281	103	68.612	3.156	.046	.311
11.5	82	70.305	3.051	.043	.337	85	71.388	3.795	.053	.412
12.5	106	72.830	2.976	.041	.289	89	74.292	3.326	.045	.353
13.5	101	75.435	4.315	.057	.429	92	78.000	2.997	.038	.312
14.5	124	78.935	3.934	.050	.353	73	79.397	2.585	.032	.271
15.5	107	83.000	3.027	.036	.292	63	80.159	2.857	.036	.360
16.5	88	83.921	3.597	.043	.383	29	81.379	1.947	.024	.361
17.5	60	85.333	3.048	.036	.393	18	81.278	2.844	.035	.670
18.5	38	86.895	2.198	.025	.356	12	81.000	2.516	.030	.726
19.5	14	85.929	3.283	.038	.877	4	81.250	.....	.....	.....
20.5	15	86.267	3.530	.041	.911	3	80.000	.....	.....	.....
Adult	9	85.222	.....	.....	.....	1	81.000	.....	.....	.....

KOREAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	4	60.500	.....	.....	.....	1	59.000	.....	.....	.....
6.5	4	64.250	.....	.....	.....	4	61.750	.....	.....	.....
7.5	7	63.000	.....	.....	.....	5	65.400	.....	.....	.....
8.5	6	65.500	.....	.....	.....	4	67.000	.....	.....	.....
9.5	8	68.625	.....	.....	.....	9	67.000	.....	.....	.....
10.5	13	67.769	3.142	.046	.871	6	70.333	.....	.....	.....
11.5	11	71.667	1.375	.019	.397	10	73.500	2.802	.038	.886
12.5	15	74.933	3.821	.051	.996	6	74.000	.....	.....	.....
13.5	14	76.714	3.881	.050	1.037	12	78.083	1.655	.021	.478
14.5	18	79.278	3.228	.041	.761	10	81.500	1.284	.016	.406
15.5	9	81.666	.....	.....	.....	22	81.318	2.202	.027	.469
16.5	7	85.285	.....	.....	.....	9	80.555	.....	.....	.....
17.5	6	83.500	.....	.....	.....	4	84.250	.....	.....	.....
18.5	2	87.000	.....	.....	.....	....	.....	.....	.....	.....
19.5	2	88.500	.....	.....	.....	....	.....	.....	.....	.....
Adult	2	91.000	.....	.....	.....	....	.....	.....	.....	.....

NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	68.000	.....	.....	.....	3	62.667	.....	.....	.....
6.5	21	63.952	3.302	.052	.720	18	63.667	3.317	.052	.782
7.5	34	66.912	2.429	.036	.416	29	65.172	2.793	.043	.519
8.5	33	68.273	3.058	.045	.532	38	66.921	2.932	.044	.476
9.5	49	69.878	2.623	.037	.375	31	69.839	3.447	.049	.619
10.5	50	70.420	2.584	.037	.365	28	72.857	3.564	.049	.673
11.5	40	73.950	2.655	.036	.420	22	74.955	3.759	.050	.801
12.5	33	75.727	3.268	.043	.569	42	76.905	4.308	.056	.665
13.5	37	77.757	4.481	.058	.736	41	81.317	4.075	.050	.634
14.5	38	82.921	4.550	.055	.738	49	81.918	3.385	.041	.483
15.5	38	86.000	4.730	.055	.767	41	83.951	4.248	.051	.663
16.5	23	88.565	2.946	.033	.614	35	85.200	3.114	.036	.526
17.5	17	89.530	3.759	.042	.912	26	85.615	3.260	.038	.639
18.5	4	93.000	.....	.....	.....	13	85.769	2.636	.031	.731
19.5	6	91.167	.....	.....	.....	5	82.400	.....	.....	.....
20.5	4	90.000	.....	.....	.....	1	83.000	.....	.....	.....
Adult	1	85.000	.....	.....	.....	4	85.000	.....	.....	.....

TABLE XIV. AGE CHANGES IN SITTING HEIGHT (IN CENTIMETERS) *continued*

SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	....	.....	.....	.....	.....	1	62.000	.....	.....	.....
6.5	29	61.862	2.700	.044	.501	28	60.179	3.117	.052	.589
7.5	51	63.176	2.705	.043	.379	50	62.400	2.561	.040	.362
8.5	37	65.054	2.545	.039	.418	53	64.226	2.478	.038	.340
9.5	42	66.833	2.689	.040	.400	56	66.304	3.217	.048	.430
10.5	46	68.891	2.844	.041	.419	51	68.471	2.615	.038	.317
11.5	53	70.925	2.874	.040	.395	54	70.167	3.304	.047	.450
12.5	51	72.392	3.576	.049	.500	62	74.129	3.816	.051	.485
13.5	41	74.415	4.570	.061	.714	60	77.250	3.150	.041	.407
14.5	31	78.226	3.338	.043	.599	53	79.528	3.647	.046	.500
15.5	18	79.833	3.933	.049	.927	38	79.763	3.248	.041	.527
16.5	12	83.583	4.072	.049	1.176	25	80.840	3.387	.042	.677
17.5	7	85.285	.....	.....	.....	17	80.588	2.030	.025	.492
18.5	3	87.333	.....	.....	.....	4	81.750	.....	.....	.....
19.5	2	86.500	.....	.....	.....	3	88.500	.....	.....	.....
20.5	1	85.000	.....	.....	.....	4	83.500	.....	.....	.....

HAWAIIAN-ASIATIC

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	2	54.500	.....	.....	.....	1	64.000	.....	.....	.....
6.5	23	62.566	2.017	.032	.420	13	61.923	2.586	.042	.717
7.5	33	63.485	2.966	.047	.516	33	63.485	2.323	.036	.404
8.5	36	65.983	3.295	.050	.548	36	66.667	2.769	.042	.462
9.5	32	67.937	3.750	.055	.662	42	67.500	2.487	.037	.384
10.5	36	69.195	3.324	.048	.554	37	70.081	3.388	.048	.557
11.5	26	72.269	2.474	.034	.485	25	74.000	3.441	.047	.688
12.5	23	74.130	2.383	.032	.496	33	76.030	3.707	.050	.671
13.5	23	75.740	4.892	.064	1.020	31	79.161	2.760	.035	.496
14.5	25	79.480	4.892	.062	.978	26	80.424	2.803	.035	.550
15.5	14	83.285	4.199	.050	1.122	18	82.722	2.744	.033	.647
16.5	8	84.870	.....	.....	.....	25	83.080	2.575	.031	.515
17.5	4	87.500	.....	.....	.....	12	82.500	1.803	.022	.520
18.5	8	88.120	.....	.....	.....	9	83.333	.....	.....	.....
19.5	8	88.250	.....	.....	.....	6	85.833	.....	.....	.....

HAWAIIAN-NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	61.000	.....	.....	.....	2	62.500	.....	.....	.....
6.5	25	64.320	3.320	.052	.664	20	64.200	2.421	.038	.541
7.5	33	65.667	3.032	.046	.528	36	64.611	3.030	.047	.505
8.5	48	67.063	3.119	.047	.450	38	67.395	2.739	.041	.444
9.5	36	69.806	2.846	.041	.474	47	68.936	3.360	.049	.490
10.5	45	70.867	2.848	.040	.425	47	72.021	3.357	.047	.490
11.5	57	72.719	3.194	.044	.423	54	74.056	3.385	.046	.461
12.5	45	74.912	3.431	.046	.511	35	76.829	4.017	.052	.679
13.5	38	77.632	4.379	.056	.710	53	79.528	3.770	.047	.518
14.5	36	81.166	5.664	.070	.944	45	81.667	3.483	.043	.519
15.5	30	84.233	3.748	.044	.684	50	82.520	2.801	.035	.396
16.5	28	86.107	4.624	.054	.874	33	83.303	2.565	.031	.446
17.5	18	90.389	2.585	.029	.609	28	83.714	3.161	.038	.597
18.5	18	88.667	3.382	.038	.797	21	83.762	2.447	.029	.533
19.5	13	89.385	2.498	.028	.692	10	85.300	1.616	.019	.511

TABLE XIV. AGE CHANGES IN SITTING HEIGHT (IN CENTIMETERS) *continued*

HAWAIIAN-SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	60.000	.....	.....	.....	....	.....	.....	.....	.....
6.5	8	61.125	.....	.....	.....	4	61.250	.....	.....	.....
7.5	12	64.667	1.972	.030	.569	13	63.307	2.052	.032	.569
8.5	19	66.368	2.960	.045	.679	10	64.100	1.446	.023	.457
9.5	21	67.952	2.379	.035	.519	16	67.687	3.176	.047	.794
10.5	16	70.125	1.453	.021	.363	13	70.000	3.574	.051	.991
11.5	21	73.429	2.855	.039	.623	18	72.222	3.242	.045	.764
12.5	12	74.500	3.500	.047	1.010	14	78.143	4.121	.053	1.101
13.5	17	75.706	3.578	.047	.868	20	76.400	3.056	.040	.683
14.5	6	81.833	.....	.....	.....	15	81.066	2.379	.029	.614
15.5	10	82.900	3.700	.045	1.169	12	81.750	2.488	.030	.718
16.5	5	85.250	.....	.....	.....	13	81.769	2.665	.033	.739
17.5	1	86.000	.....	.....	.....	4	82.750	.....	.....	.....
18.5	4	87.250	.....	.....	.....	4	82.750	.....	.....	.....

HAWAIIAN-ASIATIC-EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	3	63.333	.....	.....	.....	3	60.660	.....	.....	.....
7.5	13	64.462	2.207	.034	.612	16	63.562	2.030	.032	.508
8.5	14	66.643	2.379	.036	.636	10	66.800	1.661	.025	.525
9.5	10	68.300	3.002	.044	.949	9	68.222	.....	.....	.....
10.5	11	70.636	1.612	.023	.486	15	69.133	2.680	.039	.692
11.5	11	73.455	4.009	.055	1.209	12	73.167	3.783	.052	1.092
12.5	11	74.818	4.019	.053	1.212	11	75.818	3.564	.047	1.074
13.5	10	77.400	4.104	.053	1.297	10	79.800	3.842	.048	1.215
14.5	12	78.667	4.625	.059	1.335	13	79.846	2.107	.026	.584
15.5	3	86.333	.....	.....	.....	14	81.786	3.256	.040	.870
16.5	9	88.122	.....	.....	.....	7	83.714	2.204	.026	.833
17.5	4	87.250	.....	.....	.....	9	84.000	1.700	.020	.567
18.5	1	86.000	.....	.....	.....	1	85.000	.....	.....	.....
19.5	1	90.000	.....	.....	.....	3	88.333	.....	.....	.....
20.5	1	81.000	.....	.....	.....	1	86.000	.....	.....	.....

TABLE XV. AGE CHANGES IN RELATIVE SITTING HEIGHT

HAWAIIAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	9	54.660	.....	.....	.....	6	53.833	.....	.....	.....
7.5	19	54.263	1.162	.021	.267	28	54.571	.818	.015	.154
8.5	28	54.143	1.330	.025	.251	36	53.834	1.140	.021	.190
9.5	29	53.793	1.158	.022	.215	18	53.723	.872	.016	.206
10.5	37	53.027	1.285	.024	.211	34	53.264	1.292	.024	.222
11.5	34	52.382	.906	.017	.155	20	52.850	1.459	.028	.326
12.5	26	52.423	1.149	.022	.225	29	52.137	1.456	.028	.270
13.5	21	52.048	1.732	.033	.377	24	52.709	1.487	.028	.303
14.5	31	51.936	.979	.019	.175	26	52.654	1.175	.022	.230
15.5	16	52.000	1.058	.020	.264	18	52.500	1.166	.022	.275
16.5	7	52.000	.....	.....	.....	11	52.091	.995	.019	.299
17.5	5	52.000	.....	.....	.....	11	52.909	1.311	.025	.395
18.5	3	52.000	.....	.....	.....	8	53.250	.....	.....	.....
19.5	3	52.000	.....	.....	.....	2	54.500	.....	.....	.....

TABLE XV. AGE CHANGES IN RELATIVE SITTING HEIGHT, *continued*

CHINESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	5	54.600	.....	.....	.....	9	55.111	.....	.....	.....
6.5	49	54.878	1.637	.030	.234	37	54.568	.916	.017	.151
7.5	82	54.500	1.364	.025	.151	77	54.545	1.559	.029	.178
8.5	70	54.457	1.536	.028	.183	61	53.902	1.435	.027	.184
9.5	76	53.539	1.273	.024	.146	73	53.233	1.493	.028	.175
10.5	73	53.383	1.200	.022	.140	67	52.985	1.356	.026	.166
11.5	79	52.684	1.145	.022	.129	55	52.509	1.319	.025	.178
12.5	56	52.661	1.480	.028	.198	67	52.493	1.237	.024	.151
13.5	66	51.939	1.253	.024	.154	55	52.418	1.658	.032	.224
14.5	67	51.791	1.549	.030	.189	69	52.449	1.334	.025	.161
15.5	50	52.280	1.572	.030	.222	53	52.660	1.490	.028	.205
16.5	45	52.444	1.439	.027	.214	43	53.140	1.834	.035	.280
17.5	36	52.611	1.688	.032	.281	38	53.342	1.382	.026	.224
18.5	30	52.400	1.308	.025	.239	14	53.286	1.030	.019	.275
19.5	10	52.600	.663	.013	.210	8	53.285	.....	.....	.....
20.5	8	53.500	.....	.....	.....	1	54.600	.....	.....	.....

JAPANESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	74	55.379	1.720	.031	.200	57	55.631	1.755	.031	.232
7.5	105	54.799	1.497	.027	.147	119	55.151	1.487	.027	.136
8.5	108	55.212	1.360	.025	.131	96	54.656	1.421	.026	.145
9.5	99	54.454	1.175	.021	.118	96	54.229	1.396	.026	.142
10.5	101	54.009	1.292	.024	.128	103	54.087	1.345	.025	.132
11.5	82	53.768	1.272	.024	.140	85	54.141	1.162	.021	.126
12.5	106	52.528	1.311	.025	.127	89	53.517	1.536	.029	.163
13.5	101	53.129	1.439	.027	.143	92	53.793	1.500	.028	.156
14.5	124	53.048	1.323	.025	.119	73	53.616	1.470	.027	.172
15.5	107	53.187	1.200	.022	.116	63	54.032	1.233	.023	.155
16.5	87	53.276	1.300	.024	.139	29	53.586	.964	.018	.179
17.5	60	53.333	1.261	.024	.163	18	54.167	1.300	.024	.306
18.5	38	53.763	1.439	.027	.233	11	53.727	.964	.018	.291
19.5	14	54.071	1.162	.021	.310	4	53.643	.....	.....	.....
20.5	15	54.000	1.634	.030	.422	3	53.380	.....	.....	.....
Adult	9	54.100	.....	.....	.....	1	52.940	.....	.....	.....

KOREAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	4	55.650	.....	.....	.....	1	57.280	.....	.....	.....
6.5	4	55.265	.....	.....	.....	4	55.500	.....	.....	.....
7.5	7	55.591	.....	.....	.....	5	54.982	.....	.....	.....
8.5	6	54.216	.....	.....	.....	4	54.725	.....	.....	.....
9.5	8	54.734	.....	.....	.....	9	54.047	.....	.....	.....
10.5	13	54.154	1.025	.019	.284	6	54.050	.....	.....	.....
11.5	13	53.692	1.323	.025	.367	10	53.000	1.000	.019	.316
12.5	15	53.333	1.077	.020	.278	6	53.653	.....	.....	.....
13.5	14	53.000	1.308	.025	.350	12	53.750	1.786	.033	.516
14.5	18	52.444	.831	.016	.196	10	54.200	.872	.016	.276
15.5	9	52.574	.....	.....	.....	22	53.545	1.439	.027	.307
16.5	7	52.431	.....	.....	.....	9	53.705	.....	.....	.....
17.5	6	52.495	.....	.....	.....	4	52.613	.....	.....	.....
18.5	2	53.525	.....	.....	.....	----	.....	.....	.....	.....
19.5	2	54.350	.....	.....	.....	----	.....	.....	.....	.....
20.5	1	51.700	.....	.....	.....	---	.....	.....	.....	.....

TABLE XV. AGE CHANGES IN RELATIVE SITTING HEIGHT, *continued*

NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	53.900	.....	.....	.....	3	56.200	.....	.....	.....
6.5	21	54.095	1.063	.020	.232	18	53.611	1.860	.035	.438
7.5	34	54.118	1.183	.022	.203	29	53.414	1.327	.025	.246
8.5	33	53.152	.959	.018	.167	38	52.789	1.703	.032	.276
9.5	49	52.980	1.020	.019	.146	31	52.419	1.965	.037	.353
10.5	50	52.240	1.435	.027	.203	28	51.821	1.005	.019	.190
11.5	40	51.575	1.241	.024	.196	22	51.682	1.105	.021	.236
12.5	33	51.788	2.012	.039	.350	41	51.268	1.249	.024	.195
13.5	37	51.081	1.936	.038	.318	41	51.756	1.591	.031	.248
14.5	38	50.868	1.673	.033	.271	49	51.980	1.407	.027	.201
15.5	38	51.342	1.109	.022	.180	41	52.024	1.703	.033	.266
16.5	23	51.652	1.166	.023	.243	35	52.000	1.288	.025	.218
17.5	16	51.250	1.480	.029	.370	26	52.500	1.010	.019	.198
18.5	4	52.225	.....	.....	.....	13	52.538	1.277	.024	.354
19.5	6	52.033	.....	.....	.....	5	51.760	.....	.....	.....
20.5	4	52.550	.....	.....	.....	1	50.300	.....	.....	.....
Adult	1	51.500	.....	.....	.....	4	53.525	.....	.....	.....

SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	....	.....	.....	.....	.....	1	55.360	.....	.....	.....
6.5	29	54.276	.906	.017	.168	28	54.107	1.049	.019	.198
7.5	52	53.885	1.396	.026	.194	50	53.720	1.428	.027	.202
8.5	37	53.351	1.072	.020	.176	53	53.170	1.356	.026	.186
9.5	42	52.786	1.338	.025	.206	56	52.696	1.253	.024	.167
10.5	46	52.196	1.526	.029	.225	51	51.863	1.356	.026	.190
11.5	53	52.415	1.929	.037	.265	54	51.556	1.342	.026	.183
12.5	51	51.569	1.273	.025	.178	62	51.484	1.435	.028	.182
13.5	40	51.500	1.789	.035	.283	60	51.600	1.594	.031	.206
14.5	31	51.387	1.288	.025	.231	53	52.132	1.389	.027	.191
15.5	18	51.333	1.153	.022	.272	38	52.237	1.288	.025	.209
16.5	12	51.417	1.934	.038	.558	25	52.080	1.520	.029	.304
17.5	7	52.000	.....	.....	.....	17	52.824	.985	.019	.239
18.5	3	51.800	.....	.....	.....	4	52.572	.....	.....	.....
19.5	2	50.745	.....	.....	.....	3	53.883	.....	.....	.....
20.5	1	51.830	.....	.....	.....	4	52.800	.....	.....	.....

HAWAIIAN-ASIATIC

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	2	55.000	.....	.....	.....	1	55.600	.....	.....	.....
6.5	23	54.304	1.196	.022	.249	13	54.462	.632	.012	.175
7.5	32	54.031	1.425	.026	.252	33	54.121	1.248	.023	.217
8.5	36	54.111	1.149	.021	.191	36	54.027	.927	.017	.155
9.5	32	53.344	1.077	.020	.190	42	53.381	1.153	.022	.178
10.5	36	53.028	.959	.018	.160	37	52.189	1.122	.022	.184
11.5	26	53.077	1.208	.023	.236	25	52.480	1.136	.022	.227
12.5	23	52.305	1.265	.024	.263	32	52.312	1.104	.021	.195
13.5	22	52.000	1.382	.026	.294	31	52.742	1.480	.028	.266
14.5	25	51.560	1.170	.023	.234	26	52.461	1.118	.021	.219
15.5	14	51.786	.775	.015	.207	18	53.166	1.342	.025	.316
16.5	8	52.000	.....	.....	.....	25	53.000	1.020	.019	.204
17.5	4	52.800	.....	.....	.....	12	52.667	.849	.016	.245
18.5	8	53.020	.....	.....	.....	8	53.200	.....	.....	.....
19.5	8	52.990	.....	.....	.....	5	53.446	.....	.....	.....

TABLE XV. AGE CHANGES IN RELATIVE SITTING HEIGHT, *continued*

HAWAIIAN-NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	52.600	.....	.....	.....	2	54.100	.....	.....	.....
6.5	25	54.840	.922	.017	.184	20	54.550	1.204	.022	.269
7.5	33	54.152	1.304	.024	.227	36	53.611	1.253	.023	.209
8.5	48	53.396	1.304	.024	.188	38	53.579	.990	.018	.161
9.5	35	53.143	1.356	.026	.229	47	53.000	1.030	.019	.150
10.5	45	52.489	1.439	.027	.215	47	52.170	1.245	.024	.182
11.5	57	52.246	1.428	.027	.189	54	51.834	1.487	.029	.202
12.5	45	51.800	1.758	.034	.262	35	51.914	1.857	.036	.314
13.5	38	51.526	1.118	.022	.181	53	52.208	1.204	.023	.165
14.5	36	51.556	1.640	.032	.273	45	51.956	1.476	.028	.220
15.5	30	51.566	1.229	.024	.224	50	52.360	1.338	.026	.189
16.5	28	51.071	1.334	.026	.252	34	51.912	1.039	.020	.178
17.5	18	51.834	1.257	.024	.296	27	52.444	1.196	.023	.230
18.5	18	52.111	1.371	.026	.323	20	52.050	1.432	.028	.320
19.5	13	52.693	1.068	.020	.296	10	53.000	1.265	.024	.400

HAWAIIAN-SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	54.000	.....	.....	.....	....	.....	.....	.....	.....
6.5	8	53.550	.....	.....	.....	4	54.450	.....	.....	.....
7.5	12	54.417	1.382	.025	.040	13	54.000	.877	.016	.243
8.5	19	53.895	.721	.013	.165	10	53.200	.872	.016	.276
9.5	21	52.857	1.389	.026	.303	16	53.500	1.225	.023	.306
10.5	16	52.563	1.367	.026	.342	13	53.000	.959	.018	.266
11.5	21	52.095	1.192	.023	.260	18	52.111	1.196	.023	.281
12.5	12	51.750	.721	.014	.208	14	52.786	2.076	.039	.554
13.5	17	51.353	1.233	.024	.299	20	51.800	1.288	.025	.288
14.5	6	51.467	.....	.....	.....	12	51.834	1.068	.019	.308
15.5	10	52.300	.900	.017	.285	12	53.000	1.634	.031	.473
16.5	5	51.352	.....	.....	.....	13	52.000	1.568	.030	.435
17.5	1	52.100	.....	.....	.....	4	52.575	.....	.....	.....
18.5	4	51.560	.....	.....	.....	4	52.180	.....	.....	.....

HAWAIIAN-ASIATIC-EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	3	53.833	.....	.....	.....	3	54.366	.....	.....	.....
7.5	13	53.923	1.327	.025	.368	16	53.562	1.273	.024	.318
8.5	14	53.929	.883	.016	.236	10	53.900	1.446	.027	.457
9.5	10	53.400	1.200	.022	.380	9	52.911	.....	.....	.....
10.5	11	52.636	.772	.015	.233	15	52.267	1.183	.023	.305
11.5	11	52.364	1.149	.022	.346	12	52.583	2.020	.038	.583
12.5	11	51.727	1.054	.020	.318	11	52.000	1.349	.026	.407
13.5	10	51.200	1.077	.021	.341	10	52.500	1.118	.021	.353
14.5	12	51.500	1.257	.024	.363	13	52.231	1.476	.028	.409
15.5	3	52.433	.....	.....	.....	13	52.692	1.323	.025	.367
16.5	9	52.011	.....	.....	.....	7	53.714	.....	.....	.....
17.5	4	52.075	.....	.....	.....	9	52.791	.....	.....	.....
18.5	1	53.400	.....	.....	.....	....	.....	.....	.....	.....
19.5	1	52.600	.....	.....	.....	2	52.910	.....	.....	.....
20.5	1	51.600	.....	.....	.....	1	56.210	.....	.....	.....

TABLE XVI. AGE CHANGES IN HEAD LENGTH (IN MILLIMETERS)

HAWAIIAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	9	169.660	.....	.....	.....	6	170.166	.....	.....	.....
7.5	19	170.737	7.587	.044	1.740	28	165.035	7.092	.043	1.340
8.5	28	171.214	7.366	.043	1.391	36	169.612	7.056	.042	1.176
9.5	29	172.137	5.952	.034	1.105	19	168.790	6.630	.039	1.520
10.5	39	172.794	7.756	.045	1.241	35	171.457	5.704	.033	.964
11.5	35	174.515	6.488	.037	1.096	21	173.620	5.585	.032	1.218
12.5	35	176.257	6.783	.038	1.146	32	171.875	6.936	.040	1.226
13.5	30	175.700	8.083	.046	1.492	27	172.482	7.197	.042	1.385
14.5	35	178.857	5.837	.033	.986	34	177.176	6.692	.038	1.147
15.5	20	181.400	7.729	.043	1.728	27	177.037	6.840	.039	1.316
16.5	16	182.625	4.780	.026	1.195	18	178.612	7.573	.042	1.784
17.5	10	185.200	6.896	.037	2.181	24	176.875	5.839	.033	1.191
18.5	7	189.000	.....	.....	.....	12	176.250	5.324	.030	1.534
19.5	5	192.400	.....	.....	.....	6	176.500	.....	.....	.....
Adult	206	187.850	6.776	.036	.472	175	180.211	6.162	.034	.465

CHINESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	5	162.400	.....	.....	.....	9	164.111	.....	.....	.....
6.5	49	166.265	6.090	.037	.870	36	163.333	5.991	.037	.999
7.5	82	168.134	6.128	.036	.677	77	166.143	5.956	.036	.679
8.5	70	170.086	6.901	.040	.825	60	166.100	5.641	.034	.728
9.5	76	171.158	6.690	.039	.767	73	167.192	7.000	.042	.819
10.5	73	172.712	6.763	.039	.791	67	169.254	5.290	.031	.646
11.5	79	172.873	6.232	.036	.701	55	171.419	8.405	.049	1.133
12.5	57	175.474	6.983	.040	.925	66	171.439	6.460	.038	.795
13.5	65	176.323	6.245	.035	.775	55	171.600	7.627	.042	1.028
14.5	68	178.132	6.483	.036	.786	69	173.986	7.000	.040	.843
15.5	49	180.143	7.462	.041	1.066	56	175.661	7.508	.043	1.003
16.5	45	180.067	6.496	.036	.968	43	176.047	5.456	.031	.832
17.5	36	184.278	8.238	.045	1.373	38	176.605	7.507	.043	1.218
18.5	30	182.900	7.976	.044	1.456	14	175.786	4.279	.024	1.144
19.5	10	186.700	5.405	.029	1.709	8	174.375	.....	.....	.....
20.5	8	182.125	.....	.....	.....	1	186.000	.....	.....	.....

JAPANESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	74	165.797	5.747	.035	.668	57	162.965	5.499	.034	.728
7.5	105	168.535	5.956	.035	.581	119	163.924	6.021	.037	.552
8.5	108	170.000	6.063	.035	.581	96	164.542	5.301	.032	.541
9.5	99	170.192	5.672	.033	.570	96	166.031	6.944	.042	.709
10.5	101	171.525	6.056	.035	.602	103	168.505	5.954	.035	.587
11.5	82	173.012	5.391	.031	.595	85	168.588	6.057	.036	.657
12.5	106	174.358	6.207	.035	.603	88	171.398	5.847	.034	.623
13.5	102	175.641	6.420	.036	.635	92	174.076	6.226	.036	.649
14.5	124	178.427	6.318	.035	.567	73	174.151	5.718	.033	.669
15.5	107	178.738	6.879	.038	.665	64	174.343	5.977	.034	.741
16.5	89	182.270	5.745	.031	.609	29	176.000	5.173	.029	.961
17.5	60	184.217	7.125	.039	.919	18	174.056	7.442	.043	1.754
18.5	38	184.737	6.042	.033	.980	13	176.000	5.603	.032	1.554
19.5	15	181.533	7.098	.039	1.834	4	172.750	.....	.....	.....
20.5	15	186.933	4.539	.024	1.171	3	174.667	.....	.....	.....
Adult	10	185.700	.....	.....	.....	1	185.000	.....	.....	.....

TABLE XVI. AGE CHANGES IN HEAD LENGTH (IN MILLIMETERS), *continued*

KOREAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	4	163.000	.....	.....	.....	1	164.000	.....	.....	.....
6.5	4	170.500	.....	.....	.....	4	164.500	.....	.....	.....
7.5	7	169.286	.....	.....	.....	5	165.200	.....	.....	.....
8.5	6	166.500	.....	.....	.....	4	166.000	.....	.....	.....
9.5	8	167.625	.....	.....	.....	9	165.778	.....	.....	.....
10.5	13	170.385	6.416	.038	1.779	6	167.666	.....	.....	.....
11.5	13	168.692	7.690	.046	2.133	10	166.400	4.543	.027	1.437
12.5	15	173.000	6.948	.040	1.794	6	166.167	.....	.....	.....
13.5	14	173.929	5.007	.029	1.338	12	168.083	5.122	.030	1.479
14.5	18	175.389	5.851	.033	1.379	10	173.600	5.314	.031	1.681
15.5	9	173.777	.....	.....	.....	22	172.364	5.804	.034	1.238
16.5	7	179.286	.....	.....	.....	9	174.330	.....	.....	.....
17.5	6	178.500	.....	.....	.....	4	177.750	.....	.....	.....
18.5	2	181.000	.....	.....	.....	....	.....	.....	.....	.....
19.5	2	187.000	.....	.....	.....	....	.....	.....	.....	.....
20.5	1	192.000	.....	.....	.....	....	.....	.....	.....	.....
Adult	4	187.000	.....	.....	.....	....	.....	.....	.....	.....

NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	188.000	.....	.....	.....	3	174.667	.....	.....	.....
6.5	21	179.286	5.461	.030	1.192	18	173.111	6.855	.040	1.616
7.5	34	177.853	5.013	.028	.860	29	174.448	5.322	.031	.988
8.5	33	181.273	5.089	.028	.886	38	174.447	6.859	.039	1.113
9.5	49	180.694	6.068	.034	.867	31	175.000	7.180	.041	1.290
10.5	50	180.020	6.051	.034	.856	28	178.000	5.988	.034	1.132
11.5	40	182.875	6.214	.034	.982	21	180.286	6.295	.035	1.374
12.5	33	185.333	5.834	.031	1.015	40	181.700	4.649	.026	.735
13.5	37	185.622	8.128	.044	1.336	41	182.439	6.641	.036	1.037
14.5	38	187.368	5.851	.031	.949	49	181.816	6.948	.038	.993
15.5	38	191.263	7.148	.037	1.160	42	183.905	5.802	.032	.895
16.5	23	189.174	7.800	.041	1.626	35	183.486	6.176	.034	1.044
17.5	17	193.824	6.964	.036	1.689	25	184.720	6.017	.033	1.203
18.5	4	193.500	.....	.....	.....	13	182.692	3.910	.021	1.084
19.5	6	193.167	.....	.....	.....	5	184.000	.....	.....	.....
20.5	4	195.250	.....	.....	.....	1	185.000	.....	.....	.....
Adult	3	193.000	.....	.....	.....	12	186.333	4.069	.022	1.175

SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	....	.....	.....	.....	.....	1	176.000	.....	.....	.....
6.5	30	173.733	7.393	.043	1.350	28	170.250	5.544	.033	1.048
7.5	52	173.654	6.589	.038	.914	50	170.220	5.626	.033	.796
8.5	37	172.865	5.566	.032	.915	53	171.094	5.751	.034	.790
9.5	43	175.163	5.540	.032	.845	56	171.607	4.967	.029	.664
10.5	47	177.064	6.224	.035	.908	51	173.451	4.704	.027	.659
11.5	54	177.537	5.779	.033	.786	54	174.056	6.919	.040	.942
12.5	55	179.255	6.989	.039	.942	64	177.000	6.396	.036	.800
13.5	44	180.500	5.521	.031	.832	61	177.557	6.072	.034	.777
14.5	35	182.114	5.344	.029	.903	55	178.709	6.116	.034	.825
15.5	19	181.579	6.930	.038	1.590	40	176.050	5.891	.033	.931
16.5	12	181.583	5.693	.031	1.643	29	179.069	6.236	.035	1.158
17.5	7	190.143	.....	.....	.....	25	179.960	5.568	.031	1.114
18.5	4	185.000	.....	.....	.....	8	178.370	.....	.....	.....
19.5	2	192.000	.....	.....	.....	8	177.000	.....	.....	.....
20.5	1	184.000	.....	.....	.....	4	176.750	.....	.....	.....
Adult	2	192.500	.....	.....	.....	2	178.500	.....	.....	.....

TABLE XVI. AGE CHANGES IN HEAD LENGTH (IN MILLIMETERS), *continued*

HAWAIIAN-ASIATIC

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	2	162.000	.....	.....	.....	1	158.000	.....	.....	.....
6.5	23	170.783	4.773	.028	.995	13	164.462	8.427	.051	2.337
7.5	34	168.411	4.512	.027	.773	33	166.636	6.217	.037	1.082
8.5	35	170.858	6.787	.040	1.147	38	166.869	6.252	.038	1.014
9.5	32	170.687	6.784	.040	1.199	42	169.715	5.800	.034	.895
10.5	39	169.794	6.272	.037	1.004	37	169.811	6.079	.036	.999
11.5	26	173.154	6.803	.039	1.334	25	173.040	5.495	.032	1.099
12.5	24	174.541	5.212	.030	1.063	33	172.121	6.385	.037	1.111
13.5	24	176.791	6.683	.038	1.364	33	173.152	5.737	.033	.999
14.5	27	176.667	6.944	.039	1.336	28	174.893	7.198	.041	1.360
15.5	17	181.236	9.232	.051	2.239	21	180.455	7.947	.044	1.694
16.5	8	182.600	.....	.....	.....	30	177.500	7.079	.040	1.292
17.5	7	187.100	.....	.....	.....	15	175.733	7.352	.042	1.898
18.5	8	182.000	.....	.....	.....	15	175.534	5.196	.030	1.341
19.5	8	186.000	.....	.....	.....	8	177.370	.....	.....	.....
Adult	33	183.909	6.607	.036	1.150	30	178.100	5.394	.030	.984

HAWAIIAN-NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	181.000	.....	.....	.....	2	167.500	.....	.....	.....
6.5	25	176.480	5.679	.032	1.136	20	169.100	5.974	.035	1.336
7.5	33	172.212	6.508	.038	1.133	36	170.695	5.456	.032	.909
8.5	47	177.128	7.225	.041	1.054	38	169.816	5.920	.035	.960
9.5	36	176.583	6.043	.034	1.007	47	171.979	6.991	.041	1.020
10.5	45	177.533	5.856	.033	.873	47	174.702	6.771	.040	1.017
11.5	57	178.421	6.800	.038	.901	54	176.056	5.308	.030	.722
12.5	47	178.915	7.275	.041	1.061	35	177.114	6.563	.037	1.109
13.5	41	179.731	8.241	.046	1.287	57	178.421	6.844	.038	.906
14.5	40	183.275	9.047	.049	1.430	50	179.140	6.125	.034	.866
15.5	31	183.258	5.992	.033	1.076	53	179.925	6.111	.034	.839
16.5	31	186.032	6.078	.033	1.091	37	180.811	5.411	.030	.890
17.5	19	189.894	7.986	.042	1.832	37	182.000	6.928	.038	1.139
18.5	18	190.500	6.850	.036	1.614	25	182.000	6.158	.034	1.232
19.5	13	192.615	6.307	.033	1.749	13	183.385	5.930	.032	1.644
Adult	70	189.629	6.759	.036	.808	77	180.403	6.870	.038	.783

HAWAIIAN-SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	168.000	.....	.....	.....	....	.....	.....	.....	.....
6.5	8	169.000	.....	.....	.....	4	170.000	.....	.....	.....
7.5	12	171.083	7.963	.047	2.298	13	169.307	6.081	.036	1.686
8.5	19	171.895	7.500	.044	1.721	10	168.900	5.522	.033	1.746
9.5	21	172.952	6.722	.039	1.467	16	169.500	4.374	.026	1.093
10.5	16	177.375	6.508	.037	1.627	13	168.769	6.773	.040	1.878
11.5	21	179.191	6.329	.035	1.381	18	173.389	5.458	.032	1.286
12.5	12	182.250	7.584	.042	2.189	14	176.928	5.490	.031	1.467
13.5	18	177.389	6.626	.037	1.561	21	175.524	7.588	.043	1.655
14.5	7	185.000	.....	.....	.....	17	177.942	6.292	.035	1.526
15.5	12	178.917	8.674	.048	2.504	12	175.750	6.418	.037	1.852
16.5	5	183.800	.....	.....	.....	15	179.133	7.864	.044	2.030
17.5	3	189.300	.....	.....	.....	9	179.222	.....	.....	.....
18.5	5	189.000	.....	.....	.....	9	176.220	.....	.....	.....
Adult	19	187.157	8.689	.046	1.993					

TABLE XVI. AGE CHANGES IN HEAD LENGTH (IN MILLIMETERS), *continued*

HAWAIIAN-ASIATIC-EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	3	169.000	.....	.....	.....	3	164.000	.....	.....	.....
7.5	13	170.308	6.580	.039	1.825	16	166.125	5.786	.035	1.447
8.5	14	171.714	5.230	.030	1.398	10	171.500	7.311	.043	2.312
9.5	11	171.364	5.032	.029	1.517	9	169.889	.....	.....	.....
10.5	12	177.417	8.568	.048	2.473	15	170.467	5.703	.033	1.473
11.5	11	176.182	7.493	.043	2.258	12	178.167	4.981	.028	1.438
12.5	11	176.636	6.826	.039	2.058	12	173.833	5.785	.033	1.670
13.5	11	175.818	6.833	.039	2.059	10	174.700	8.866	.051	2.803
14.5	12	179.333	5.662	.031	1.634	16	174.375	3.997	.023	.999
15.5	4	188.250	.....	.....	.....	17	178.941	6.150	.034	1.492
16.5	9	185.889	.....	.....	.....	10	178.400	6.200	.035	1.961
17.5	4	191.750	.....	.....	.....	10	178.800	9.453	.053	2.989
18.5	1	195.000	.....	.....	.....	2	175.500	.....	.....	.....
19.5	1	184.000	.....	.....	.....	3	178.333	.....	.....	.....
20.5	1	172.000	.....	.....	.....	1	164.000	.....	.....	.....
Adult	....	.....	.....	.....	.....	4	180.500	.....	.....	.....

TABLE XVII. AGE CHANGES IN HEAD WIDTH (IN MILLIMETERS)

HAWAIIAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	9	147.000	.....	.....	.....	6	138.000	.....	.....	.....
7.5	19	146.579	5.185	.035	1.189	28	139.642	4.716	.034	.891
8.5	28	145.571	5.004	.034	.945	36	143.250	4.303	.030	.717
9.5	29	146.620	4.888	.033	.907	19	143.000	4.932	.034	1.131
10.5	39	146.411	5.372	.037	.860	35	142.257	6.002	.042	1.014
11.5	35	147.200	4.892	.033	.826	21	144.714	4.368	.030	.953
12.5	35	148.000	4.250	.029	.718	32	144.812	4.673	.032	.826
13.5	30	149.167	4.314	.029	.796	27	142.444	7.131	.050	1.372
14.5	35	149.828	4.576	.030	.773	34	146.088	4.774	.033	.819
15.5	20	149.650	6.002	.040	1.342	27	148.333	5.078	.034	.977
16.5	16	152.063	4.423	.029	1.105	18	149.778	4.589	.031	1.081
17.5	10	156.900	2.300	.015	.727	24	149.459	5.275	.035	1.076
18.5	7	155.285	.....	.....	.....	12	148.833	5.289	.036	1.526
19.5	5	153.800	.....	.....	.....	9	151.222	.....	.....	.....
Adult	206	157.669	5.497	.034	.383	175	152.497	4.848	.032	.366

CHINESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	5	142.400	.....	.....	.....	9	138.556	.....	.....	.....
6.5	49	143.347	5.145	.036	.735	37	139.594	4.923	.035	.809
7.5	82	144.622	5.305	.037	.586	77	138.818	5.071	.037	.578
8.5	70	143.743	5.092	.035	.608	61	139.033	4.609	.033	.590
9.5	76	144.803	5.185	.036	.595	72	140.667	4.793	.034	.565
10.5	73	143.644	4.624	.032	.541	67	141.104	5.002	.035	.611
11.5	79	144.544	5.160	.036	.580	55	141.655	5.394	.038	.727
12.5	57	146.123	6.628	.045	.878	67	142.612	5.447	.038	.665
13.5	66	146.561	4.317	.029	.531	55	143.473	5.843	.041	.788
14.5	68	147.794	6.342	.043	.769	69	143.739	5.072	.035	.611
15.5	49	148.224	6.142	.041	.877	56	143.411	4.884	.034	.653
16.5	45	148.822	5.712	.038	.851	43	145.907	6.057	.042	.924
17.5	36	150.333	5.228	.035	.871	38	145.763	5.397	.037	.876
18.5	30	151.633	5.618	.037	1.026	14	147.000	4.810	.033	1.285
19.5	10	152.300	6.246	.041	1.975	8	147.000	.....	.....	.....
20.5	8	149.875	.....	.....	.....	1	151.000	.....	.....	.....

TABLE XVI. AGE CHANGES IN HEAD WIDTH (IN MILLIMETERS), *continued*

JAPANESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	74	145.175	4.712	.032	.548	57	141.947	4.907	.034	.650
7.5	105	146.972	5.083	.034	.496	118	141.797	4.843	.034	.446
8.5	108	146.371	4.500	.031	.433	96	141.073	4.576	.032	.467
9.5	99	144.859	4.893	.034	.492	96	141.458	4.897	.035	.500
10.5	101	147.356	4.981	.034	.496	103	142.689	4.829	.034	.476
11.5	82	147.390	5.574	.038	.616	85	143.470	5.024	.035	.545
12.5	106	148.123	5.072	.034	.493	89	143.483	4.785	.033	.507
13.5	102	149.274	5.367	.036	.531	92	145.261	5.173	.036	.539
14.5	124	149.927	5.159	.034	.463	73	146.178	4.470	.031	.523
15.5	107	150.403	4.980	.033	.481	65	146.231	4.650	.032	.577
16.5	89	153.090	5.955	.039	.631	29	147.690	3.621	.025	.672
17.5	60	152.500	5.306	.038	.685	18	146.722	3.680	.025	.867
18.5	38	153.895	7.512	.049	1.219	13	148.769	7.767	.052	2.154
19.5	15	151.467	4.645	.031	1.199	4	152.500	.....	.....	.....
20.5	15	150.200	3.447	.023	.890	3	147.333	.....	.....	.....
Adult	10	150.500	.....	.....	.....	1	155.000	.....	.....	.....

KOREAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	4	148.750	.....	.....	.....	1	141.000	.....	.....	.....
6.5	4	152.000	.....	.....	.....	4	139.750	.....	.....	.....
7.5	7	145.286	.....	.....	.....	5	141.800	.....	.....	.....
8.5	6	144.833	.....	.....	.....	4	141.500	.....	.....	.....
9.5	8	147.500	.....	.....	.....	9	141.111	.....	.....	.....
10.5	13	148.846	5.405	.036	1.499	6	140.500	.....	.....	.....
11.5	13	148.385	2.871	.019	.796	10	146.100	4.300	.029	1.360
12.5	15	149.733	4.450	.030	1.149	6	145.333	.....	.....	.....
13.5	14	148.429	4.012	.027	1.072	12	147.500	3.775	.026	1.090
14.5	18	148.667	4.830	.032	1.138	10	146.200	4.142	.028	1.310
15.5	9	148.000	.....	.....	.....	21	146.619	2.968	.020	.648
16.5	7	152.429	.....	.....	.....	9	144.550	.....	.....	.....
17.5	6	151.833	.....	.....	.....	4	142.250	.....	.....	.....
18.5	2	143.500	.....	.....	.....	....	.....	.....	.....	.....
19.5	2	157.000	.....	.....	.....	....	.....	.....	.....	.....
20.5	1	141.000	.....	.....	.....	....	.....	.....	.....	.....
Adult	4	160.250	.....	.....	.....	....	.....	.....	.....	.....

NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	145.000	.....	.....	.....	3	138.667	.....	.....	.....
6.5	21	141.810	5.395	.038	1.177	18	136.778	5.808	.042	1.369
7.5	34	142.765	4.412	.031	.757	29	137.241	4.539	.033	.843
8.5	33	142.212	4.118	.029	.717	38	139.421	4.794	.034	.778
9.5	49	143.143	4.490	.031	.641	31	137.742	6.252	.045	1.123
10.5	50	144.520	5.478	.038	.775	28	140.071	4.367	.031	.825
11.5	40	145.650	5.048	.035	.798	21	143.095	5.023	.035	1.096
12.5	33	145.121	4.354	.030	.758	41	141.488	4.001	.028	.625
13.5	37	145.838	4.835	.033	.795	41	143.268	5.306	.037	.829
14.5	38	148.632	5.348	.036	.868	49	143.306	5.296	.037	.757
15.5	37	148.784	5.052	.034	.831	41	142.195	4.905	.034	.766
16.5	23	148.565	4.604	.031	.960	35	143.343	4.672	.033	.790
17.5	17	149.235	5.407	.036	1.311	26	144.192	5.421	.038	1.063
18.5	4	152.500	.....	.....	.....	13	143.769	3.400	.024	.943
19.5	6	150.667	.....	.....	.....	5	148.000	.....	.....	.....
20.5	4	147.250	.....	.....	.....	1	141.000	.....	.....	.....
Adult	3	154.000	.....	.....	.....	12	144.666	.....	.....	.....

TABLE XVI. AGE CHANGES IN HEAD WIDTH (IN MILLIMETERS), *continued*

SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	....	.....	.....	.....	.....	1	142.000	.....	.....	.....
6.5	30	140.600	4.814	.034	.879	28	135.179	3.557	.026	.672
7.5	52	140.558	5.394	.038	.748	50	134.760	4.628	.034	.655
8.5	37	140.378	3.774	.027	.620	53	137.094	4.358	.032	.599
9.5	43	140.186	4.260	.030	.650	56	137.321	4.517	.033	.604
10.5	47	142.255	4.184	.029	.610	51	138.431	4.249	.031	.595
11.5	54	142.315	4.550	.032	.619	54	138.444	4.791	.035	.652
12.5	55	142.582	5.601	.039	.755	64	140.688	4.171	.030	.521
13.5	44	143.364	6.216	.043	.937	61	141.279	4.875	.035	.624
14.5	35	144.200	5.450	.038	.921	55	142.655	4.844	.034	.653
15.5	19	143.579	4.649	.032	1.067	40	141.850	4.912	.035	.777
16.5	12	147.333	6.155	.042	1.777	29	144.276	5.139	.036	.954
17.5	7	147.486	.....	.....	.....	25	144.880	5.552	.038	1.110
18.5	4	150.500	.....	.....	.....	8	144.744	.....	.....	.....
19.5	2	151.000	.....	.....	.....	8	141.250	.....	.....	.....
20.5	1	148.000	.....	.....	.....	4	142.250	.....	.....	.....
Adult	2	148.000	.....	.....	.....	2	150.000	.....	.....	.....

HAWAIIAN-ASIATIC

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	2	139.000	.....	.....	.....	1	137.000	.....	.....	.....
6.5	23	144.174	5.798	.040	1.208	13	140.308	5.809	.041	1.611
7.5	34	145.235	4.934	.034	.846	33	140.303	4.859	.035	.846
8.5	35	147.314	5.059	.034	.855	38	141.132	4.033	.029	.654
9.5	32	145.375	5.122	.035	.905	42	142.262	4.331	.030	.668
10.5	39	146.769	5.898	.040	.944	37	141.486	5.391	.038	.886
11.5	26	147.000	4.796	.033	.940	25	146.080	4.681	.032	.936
12.5	24	147.916	4.645	.031	.948	33	146.424	4.465	.031	.777
13.5	24	148.375	5.786	.039	1.181	33	147.697	6.068	.041	1.056
14.5	27	149.518	6.220	.042	1.197	28	146.357	4.538	.031	.858
15.5	17	150.765	4.506	.030	1.092	21	148.952	5.186	.035	1.132
16.5	8	155.000	.....	.....	.....	30	148.334	4.307	.029	.786
17.5	7	153.100	.....	.....	.....	15	149.533	4.924	.033	1.271
18.5	8	152.500	.....	.....	.....	15	149.067	4.450	.030	1.148
19.5	8	155.500	.....	.....	.....	8	153.500	.....	.....	.....
Adult	33	157.636	4.990	.032	.868	30	150.333	5.147	.034	.939

HAWAIIAN-NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	138.000	.....	.....	.....	2	142.500	.....	.....	.....
6.5	25	142.960	4.737	.033	.947	20	139.350	3.305	.024	.739
7.5	33	143.485	5.473	.038	.953	36	138.556	5.058	.037	.843
8.5	47	145.426	3.929	.027	.573	38	140.447	4.903	.035	.795
9.5	36	145.722	5.151	.035	.859	47	140.128	5.767	.041	.841
10.5	45	144.422	4.923	.034	.734	47	141.809	4.246	.030	.619
11.5	57	145.351	4.836	.033	.641	54	141.870	4.303	.030	.586
12.5	47	147.277	5.433	.037	.792	35	143.114	5.291	.037	.894
13.5	41	147.024	4.771	.032	.745	57	144.540	5.056	.035	.670
14.5	40	148.350	5.058	.034	.799	50	144.980	4.827	.033	.683
15.5	31	149.194	4.453	.030	.800	53	146.151	5.078	.035	.698
16.5	31	148.678	4.343	.029	.779	38	146.289	5.982	.041	.971
17.5	19	153.684	4.714	.031	1.081	37	147.162	4.812	.033	.791
18.5	18	153.445	3.113	.020	.734	25	145.800	4.854	.033	.971
19.5	12	153.583	5.139	.033	1.484	13	151.462	6.440	.043	1.786
Adult	70	156.229	5.972	.038	.714	79	149.620	5.413	.036	.609

TABLE XVI. AGE CHANGES IN HEAD WIDTH (IN MILLIMETERS), *continued*

HAWAIIAN-SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	137.000	.....	.....	.....	....	.....	.....	.....	.....
6.5	8	138.875	.....	.....	.....	4	139.000	.....	.....	.....
7.5	12	142.167	3.172	.022	.916	13	139.538	3.295	.024	.913
8.5	19	143.526	4.173	.029	.957	10	139.500	4.365	.031	1.380
9.5	21	145.571	5.811	.040	1.267	16	140.000	5.327	.038	1.331
10.5	16	145.063	4.492	.031	1.123	13	139.615	5.916	.042	1.641
11.5	21	146.190	3.813	.026	.832	18	139.833	5.747	.041	1.354
12.5	12	146.583	5.122	.035	1.479	14	142.142	3.562	.025	.951
13.5	18	146.166	5.294	.036	1.247	21	143.810	4.707	.033	1.027
14.5	7	153.000	.....	.....	.....	17	146.235	4.080	.028	.989
15.5	12	148.417	2.985	.020	.862	12	145.583	4.734	.033	1.366
16.5	5	146.800	.....	.....	.....	15	144.800	5.799	.040	1.497
17.5	3	156.660	.....	.....	.....	8	144.250	.....	.....	.....
18.5	5	148.200	.....	.....	.....	9	146.777	.....	.....	.....
Adult	19	157.579	5.641	.036	1.294	....	.....	.....	.....	.....

HAWAIIAN-ASIATIC-EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	3	138.333	.....	.....	.....	3	133.000	.....	.....	.....
7.5	13	142.462	3.250	.023	.901	16	137.875	4.060	.029	1.015
8.5	14	146.714	5.378	.037	1.437	10	139.100	3.986	.029	1.260
9.5	11	148.091	5.071	.034	1.529	9	144.444	.....	.....	.....
10.5	12	144.500	5.284	.036	1.525	15	142.400	5.560	.039	1.436
11.5	11	145.091	4.441	.031	1.339	12	140.667	3.771	.027	1.089
12.5	11	147.182	6.162	.042	1.858	12	143.583	4.443	.031	1.283
13.5	11	149.727	4.863	.032	1.466	10	144.300	5.478	.038	1.732
14.5	12	150.667	5.822	.039	1.681	16	146.625	4.328	.029	1.082
15.5	4	153.000	.....	.....	.....	17	147.529	4.616	.031	1.119
16.5	9	154.222	.....	.....	.....	10	147.200	3.487	.024	1.102
17.5	4	150.750	.....	.....	.....	10	148.100	4.949	.033	1.565
18.5	1	152.000	.....	.....	.....	2	155.000	.....	.....	.....
19.5	1	158.000	.....	.....	.....	3	151.333	.....	.....	.....
20.5	1	155.000	.....	.....	.....	1	154.000	.....	.....	.....
Adult	....	.....	.....	.....	.....	4	151.750	.....	.....	.....

TABLE XVIII. AGE CHANGES IN CEPHALIC INDEX

HAWAIIAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	9	86.880	.....	.....	.....	6	81.000	.....	.....	.....
7.5	19	86.053	5.155	.060	1.182	28	84.786	5.212	.061	.985
8.5	28	85.215	5.544	.065	1.047	36	84.583	4.985	.059	.831
9.5	29	85.241	4.584	.054	.851	19	84.895	4.530	.053	1.039
10.5	39	84.949	5.287	.062	.846	35	83.057	4.809	.058	.812
11.5	35	84.429	3.804	.045	.643	21	83.476	3.673	.044	.802
12.5	35	84.172	4.011	.048	.677	32	84.312	3.803	.045	.672
13.5	30	85.067	4.632	.054	.845	27	82.630	5.151	.062	.991
14.5	35	83.829	3.597	.043	.608	34	82.588	3.751	.045	.643
15.5	20	82.600	4.477	.054	1.000	27	83.741	4.631	.055	.891
16.5	16	83.375	3.138	.038	.784	18	84.000	4.110	.049	.968
17.5	10	84.828	.....	.....	.....	24	84.417	3.785	.045	.772
18.5	7	82.285	.....	.....	.....	12	84.750	4.798	.057	1.385
19.5	5	80.000	.....	.....	.....	9	87.111	.....	.....	.....
Adult	206	84.010	3.662	.044	.255	175	84.686	3.626	.043	.274

TABLE XVIII. AGE CHANGES IN CEPHALIC INDEX, *continued*

CHINESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	5	87.848	.....	.....	.....	9	84.555	.....	.....	.....
6.5	49	86.265	4.848	.056	.693	36	85.695	4.483	.052	.747
7.5	82	85.805	4.610	.054	.509	77	83.714	4.392	.052	.501
8.5	70	84.571	4.993	.059	.597	61	83.951	4.481	.053	.574
9.5	76	84.790	4.529	.053	.519	73	84.109	4.992	.059	.584
10.5	73	83.356	4.691	.056	.549	67	83.328	4.373	.052	.534
11.5	79	83.861	4.524	.054	.509	55	82.982	5.136	.062	.693
12.5	57	83.491	6.111	.073	.809	66	83.485	5.025	.060	.619
13.5	66	83.318	4.321	.052	.532	55	83.127	4.988	.060	.673
14.5	68	82.926	4.554	.055	.552	69	82.710	4.298	.052	.517
15.5	49	82.163	4.138	.050	.591	56	81.821	4.925	.060	.658
16.5	45	82.667	4.585	.055	.683	43	82.698	3.637	.044	.555
17.5	36	81.667	5.175	.063	.862	38	82.079	4.781	.058	.776
18.5	30	83.100	5.243	.063	.957	14	83.714	3.731	.045	.997
19.5	10	81.400	2.498	.031	.790	8	84.250	.....	.....	.....
20.5	8	81.250	.....	.....	.....	1	81.200	.....	.....	.....

JAPANESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	74	87.567	4.233	.048	.492	57	87.088	4.914	.056	.651
7.5	105	87.285	4.616	.053	.450	118	86.669	4.168	.048	.384
8.5	108	86.296	4.433	.051	.426	96	85.625	3.772	.044	.385
9.5	99	86.273	3.965	.046	.398	96	85.510	4.614	.054	.471
10.5	101	85.723	4.660	.054	.463	103	84.330	5.492	.065	.541
11.5	82	85.268	3.838	.045	.424	85	85.200	4.548	.053	.493
12.5	106	85.207	4.429	.052	.430	89	83.719	3.677	.044	.390
13.5	102	85.128	4.482	.053	.444	92	83.457	4.079	.049	.426
14.5	124	84.081	3.636	.043	.326	73	84.109	3.632	.043	.425
15.5	107	83.963	4.009	.048	.386	64	84.094	3.940	.047	.493
16.5	89	84.045	3.946	.047	.418	29	83.897	3.418	.041	.635
17.5	60	82.800	4.979	.060	.643	18	84.333	3.400	.040	.801
18.5	38	83.131	4.900	.059	.795	13	84.692	5.783	.068	1.604
19.5	15	82.867	3.442	.041	.889	4	88.513	.....	.....	.....
20.5	15	80.267	3.172	.039	.819	3	84.470	.....	.....	.....
Adult	10	81.100	.....	.....	.....	1	83.800	.....	.....	.....

KOREAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	4	91.303	.....	.....	.....	1	85.980	.....	.....	.....
6.5	4	89.192	.....	.....	.....	4	85.070	.....	.....	.....
7.5	7	86.004	.....	.....	.....	5	83.794	.....	.....	.....
8.5	6	87.120	.....	.....	.....	4	85.282	.....	.....	.....
9.5	8	88.058	.....	.....	.....	9	85.222	.....	.....	.....
10.5	13	87.538	5.401	.062	1.498	6	84.233	.....	.....	.....
11.5	13	88.308	4.232	.048	1.174	10	88.000	3.873	.044	1.225
12.5	15	86.667	4.512	.052	1.165	6	87.533	.....	.....	.....
13.5	14	85.500	3.480	.041	.930	12	87.917	3.353	.038	.968
14.5	18	84.889	3.463	.041	.816	10	84.200	4.600	.055	1.455
15.5	9	83.713	.....	.....	.....	22	85.818	4.697	.055	1.001
16.5	7	85.163	.....	.....	.....	9	82.967	.....	.....	.....
17.5	6	85.172	.....	.....	.....	4	80.040	.....	.....	.....
18.5	2	79.275	.....	.....	.....	....	.....	.....	.....	.....
19.5	2	83.950	.....	.....	.....	....	.....	.....	.....	.....
Adult	5	83.380	.....	.....	.....	....	.....	.....	.....	.....

TABLE XVIII. AGE CHANGES IN CEPHALIC INDEX, *continued*

NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	77.100	.....	.....	.....	3	79.400	.....	.....	.....
6.5	21	79.143	4.357	.055	.951	18	79.278	3.015	.038	.711
7.5	34	80.324	3.288	.041	.564	29	78.724	3.106	.039	.577
8.5	33	78.545	3.105	.040	.540	38	80.026	4.010	.050	.651
9.5	49	79.347	3.952	.050	.565	31	78.774	4.702	.060	.844
10.5	50	80.460	4.144	.052	.586	28	78.857	4.224	.054	.798
11.5	40	79.775	3.764	.047	.595	21	79.381	4.204	.053	.917
12.5	33	78.364	3.043	.039	.530	41	78.122	2.717	.035	.424
13.5	37	78.757	3.766	.048	.619	41	78.659	3.746	.048	.585
14.5	38	79.421	3.726	.047	.604	49	78.980	2.818	.036	.404
15.5	37	77.946	3.416	.044	.562	41	77.366	2.895	.037	.452
16.5	23	78.696	3.356	.043	.700	35	78.200	2.907	.037	.491
17.5	17	77.059	3.621	.047	.878	26	78.731	4.274	.054	.838
18.5	4	78.420	.....	.....	.....	13	78.846	2.598	.033	.720
19.5	6	78.033	.....	.....	.....	5	80.400	.....	.....	.....
20.5	4	75.425	.....	.....	.....	1	76.200	.....	.....	.....
Adult	3	79.867	.....	.....	.....	12	77.750	2.587	.033	.747

SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	....	.....	.....	.....	.....	1	80.700	.....	.....	.....
6.5	30	81.133	4.667	.058	.852	28	79.464	2.784	.035	.526
7.5	52	81.000	4.215	.052	.585	50	79.260	3.279	.041	.464
8.5	37	81.297	3.432	.042	.564	53	80.170	3.375	.042	.464
9.5	43	80.070	3.507	.044	.535	56	80.107	3.524	.044	.471
10.5	47	80.362	2.905	.036	.424	51	79.843	2.893	.036	.405
11.5	54	80.204	3.279	.041	.446	54	79.704	3.759	.047	.512
12.5	55	79.727	4.563	.057	.615	64	79.578	3.330	.042	.416
13.5	44	79.568	4.186	.053	.631	61	79.738	3.552	.045	.455
14.5	35	79.343	3.847	.048	.650	55	79.964	3.587	.045	.484
15.5	19	79.158	3.870	.049	.888	40	80.725	3.821	.047	.604
16.5	12	81.167	3.531	.044	1.019	29	80.690	3.333	.041	.619
17.5	7	77.571	.....	.....	.....	25	80.600	3.150	.039	.630
18.5	4	81.485	.....	.....	.....	8	81.083	.....	.....	.....
19.5	2	78.625	.....	.....	.....	8	81.325	.....	.....	.....
20.5	1	80.430	.....	.....	.....	4	80.500	.....	.....	.....
Adult	2	76.900	.....	.....	.....	2	84.200	.....	.....	.....

HAWAIIAN-ASIATIC

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	2	85.500	.....	.....	.....	1	86.700	.....	.....	.....
6.5	23	84.435	3.373	.040	.703	13	85.462	6.708	.078	1.861
7.5	34	86.352	4.129	.048	.708	33	84.273	4.882	.058	.850
8.5	35	86.286	4.327	.050	.731	38	84.632	3.835	.045	.622
9.5	32	85.281	5.014	.059	.886	42	83.905	4.257	.051	.657
10.5	39	86.461	4.308	.050	.690	37	83.405	4.605	.055	.757
11.5	26	85.038	4.136	.049	.811	25	84.520	3.900	.046	.780
12.5	24	84.833	2.795	.033	.570	33	85.182	3.841	.045	.669
13.5	24	83.750	4.156	.050	.848	33	84.424	3.869	.046	.674
14.5	27	84.592	5.431	.064	1.045	28	83.678	4.552	.054	.860
15.5	17	83.412	5.180	.062	1.256	21	82.857	4.390	.053	.958
16.5	8	84.875	.....	.....	.....	30	83.267	3.768	.045	.688
17.5	7	81.900	.....	.....	.....	15	85.267	3.957	.046	1.022
18.5	8	83.780	.....	.....	.....	15	84.934	4.434	.052	1.145
19.5	8	83.690	.....	.....	.....	8	86.596	.....	.....	.....
Adult	33	85.940	3.393	.039	.590	30	84.333	3.636	.043	.664

TABLE XVIII. AGE CHANGES IN CEPHALIC INDEX, *continued*

HAWAIIAN-NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	76.200	.....	.....	.....	2	85.000	.....	.....	.....
6.5	25	81.080	3.856	.048	.771	20	82.450	3.788	.046	.847
7.5	33	83.485	4.452	.053	.775	36	81.250	3.138	.039	.523
8.5	47	82.170	4.234	.052	.618	38	82.816	4.530	.055	.735
9.5	36	82.583	3.632	.044	.605	47	81.532	3.747	.046	.547
10.5	45	81.467	4.129	.051	.616	47	81.234	3.669	.045	.535
11.5	57	81.596	4.155	.051	.550	54	80.574	3.046	.038	.415
12.5	47	82.447	4.528	.055	.660	35	80.829	3.700	.046	.625
13.5	41	81.951	4.612	.056	.720	57	81.140	4.343	.054	.575
14.5	40	81.025	4.021	.050	.635	50	81.060	4.343	.054	.614
15.5	31	81.516	3.991	.049	.717	53	81.453	3.719	.046	.511
16.5	31	79.710	2.807	.035	.504	37	81.081	4.264	.053	.701
17.5	19	81.053	4.454	.055	1.022	37	81.000	3.676	.045	.604
18.5	18	80.611	3.561	.044	.839	25	80.200	3.137	.039	.627
19.5	12	79.750	3.538	.044	1.021	13	82.769	3.945	.049	1.094
Adult	70	82.443	3.850	.047	.460	77	83.156	4.402	.053	.502

HAWAIIAN-SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	81.600	.....	.....	.....	....	.....	.....	.....	.....
6.5	8	82.225	.....	.....	.....	4	80.925	.....	.....	.....
7.5	12	83.083	4.554	.055	1.315	13	82.692	3.791	.046	1.051
8.5	19	83.684	4.142	.049	.950	10	82.900	3.986	.048	1.260
9.5	21	84.524	4.542	.054	.991	16	82.687	3.348	.040	.837
10.5	16	81.813	4.475	.055	1.118	13	82.923	5.797	.070	1.608
11.5	21	81.571	3.762	.046	.821	18	80.778	3.457	.043	.814
12.5	12	80.667	3.682	.046	1.062	14	80.429	4.135	.051	1.105
13.5	18	82.500	3.655	.044	.861	21	82.000	3.409	.042	.744
14.5	7	82.814	.....	.....	.....	17	82.176	2.975	.036	.721
15.5	12	82.750	4.024	.049	1.161	12	82.917	3.013	.036	.870
16.5	5	79.990	.....	.....	.....	15	81.000	4.733	.058	1.222
17.5	3	82.800	.....	.....	.....	8	81.148	.....	.....	.....
18.5	5	78.398	.....	.....	.....	9	83.372	.....	.....	.....
Adult	19	84.316	3.312	.039	.759	....	.....	.....	.....	.....

HAWAIIAN-ASIATIC-EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	3	81.900	.....	.....	.....	3	81.166	.....	.....	.....
7.5	13	83.846	3.800	.045	1.054	16	83.187	4.863	.058	1.216
8.5	14	85.571	3.245	.038	.867	10	80.200	5.671	.071	1.793
9.5	11	86.454	3.775	.044	1.138	9	83.567	.....	.....	.....
10.5	12	81.667	5.661	.069	1.634	15	83.600	3.738	.045	.965
11.5	11	82.273	3.387	.041	1.021	12	78.917	2.782	.035	.803
12.5	11	83.454	6.185	.074	1.865	12	82.750	4.245	.051	1.225
13.5	11	84.455	5.034	.060	1.517	10	82.600	4.055	.049	1.282
14.5	12	84.083	5.156	.061	1.488	16	84.375	3.997	.047	.999
15.5	4	81.415	.....	.....	.....	17	82.412	4.117	.050	.998
16.5	9	83.089	.....	.....	.....	10	82.500	2.729	.033	.863
17.5	4	78.675	.....	.....	.....	10	83.000	5.916	.071	1.889
18.5	1	77.900	.....	.....	.....	2	88.250	.....	.....	.....
19.5	1	85.900	.....	.....	.....	3	84.923	.....	.....	.....
20.5	1	90.100	.....	.....	.....	1	93.900	.....	.....	.....
Adult	....	.....	.....	.....	.....	4	84.170	.....	.....	.....

TABLE XIX. AGE CHANGES IN MINIMUM FRONTAL (IN MILLIMETERS)

HAWAIIAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	9	100.110	.....	.....	.....	6	98.666	.....	.....	.....
7.5	19	99.789	3.995	.040	.916	28	98.857	5.137	.052	.970
8.5	28	102.036	3.803	.037	.718	36	100.834	4.469	.044	.745
9.5	29	101.690	5.154	.051	.957	19	101.473	5.604	.055	1.285
10.5	39	103.358	4.906	.047	.785	35	102.514	5.040	.049	.851
11.5	35	104.400	4.390	.042	.742	21	104.285	5.063	.048	1.104
12.5	35	104.666	3.818	.036	.645	32	104.813	4.946	.047	.874
13.5	30	105.400	4.371	.041	.806	27	105.814	5.578	.053	1.073
14.5	35	108.485	4.365	.040	.737	34	106.883	5.290	.049	.907
15.5	20	109.200	4.106	.038	.918	27	107.629	4.465	.041	.859
16.5	16	107.687	4.412	.041	1.103	18	108.222	4.871	.045	1.148
17.5	10	109.900	5.412	.049	1.712	24	108.000	4.435	.041	.905
18.5	7	110.857	.....	.....	.....	12	109.417	3.569	.033	1.030
19.5	5	108.800	.....	.....	.....	9	107.222	.....	.....	.....
Adult	206	107.850	4.966	.046	.346	175	106.063	5.022	.047	.379

CHINESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	5	94.200	.....	.....	.....	9	92.222	.....	.....	.....
6.5	49	97.857	4.621	.047	.660	37	95.567	4.676	.049	.769
7.5	81	98.741	3.747	.038	.416	77	97.234	3.596	.035	.410
8.5	70	99.443	3.969	.040	.474	61	97.590	4.087	.042	.523
9.5	76	101.487	3.981	.039	.457	73	100.096	3.994	.040	.467
10.5	73	101.781	3.976	.039	.465	67	101.179	3.943	.034	.482
11.5	79	101.696	4.214	.041	.474	55	102.455	4.805	.047	.648
12.5	57	104.579	4.337	.041	.574	67	103.179	3.813	.037	.466
13.5	66	105.576	4.961	.047	.611	55	105.291	5.790	.055	.781
14.5	68	107.191	5.258	.049	.638	69	106.536	4.063	.038	.489
15.5	49	108.592	5.845	.054	.835	56	106.446	4.399	.041	.588
16.5	45	109.267	4.266	.039	.636	43	109.209	4.140	.038	.631
17.5	36	111.472	4.350	.039	.725	38	108.316	4.206	.039	.682
18.5	30	111.567	4.709	.042	.860	14	107.643	2.893	.027	.773
19.5	10	110.800	4.622	.042	1.462	8	113.625	.....	.....	.....
20.5	8	110.625	.....	.....	.....	1	117.000	.....	.....	.....

JAPANESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	74	96.798	5.306	.055	.617	57	95.754	5.079	.053	.673
7.5	105	99.429	4.056	.041	.396	118	98.102	4.883	.050	.449
8.5	108	100.814	4.342	.043	.418	96	98.865	3.654	.037	.373
9.5	99	101.434	4.091	.040	.411	96	100.427	4.173	.041	.426
10.5	101	101.356	3.778	.037	.376	103	102.087	3.901	.038	.384
11.5	82	102.878	3.933	.038	.434	85	103.012	4.575	.044	.496
12.5	106	104.604	4.258	.041	.413	89	104.371	4.127	.040	.437
13.5	102	106.392	4.524	.042	.448	92	106.652	4.302	.040	.448
14.5	124	108.556	5.173	.048	.465	73	107.315	4.316	.040	.505
15.5	107	109.841	4.554	.041	.440	64	108.266	4.424	.041	.553
16.5	89	110.607	5.027	.045	.533	29	109.379	3.864	.035	.718
17.5	60	111.800	4.999	.045	.645	18	108.833	4.924	.045	1.160
18.5	38	111.342	5.503	.049	.893	13	108.462	3.974	.037	1.102
19.5	15	110.867	4.208	.038	1.086	4	110.250	.....	.....	.....
20.5	15	111.533	4.544	.041	1.173	3	109.333	.....	.....	.....
Adult	10	109.500	.....	.....	.....	1	116.000	.....	.....	.....

TABLE XIX. AGE CHANGES IN MINIMUM FRONTAL (IN MILLIMETERS), *continued*

KOREAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	4	97.250	.....	.....	.....	5	91.000	.....	.....	.....
6.5	4	100.750	.....	.....	.....	4	100.500	.....	.....	.....
7.5	7	99.571	.....	.....	.....	5	97.200	.....	.....	.....
8.5	6	101.666	.....	.....	.....	4	103.500	.....	.....	.....
9.5	8	104.875	.....	.....	.....	9	102.333	.....	.....	.....
10.5	13	104.077	4.649	.045	1.289	6	103.833	.....	.....	.....
11.5	13	104.462	3.915	.037	1.086	10	106.000	3.701	.035	1.170
12.5	15	107.067	3.991	.037	1.030	6	108.500	.....	.....	.....
13.5	14	107.286	3.712	.035	.992	12	110.333	3.036	.028	.876
14.5	18	111.611	4.424	.040	1.043	10	114.000	4.980	.044	1.575
15.5	9	108.444	.....	.....	.....	22	110.409	5.750	.052	1.226
16.5	7	113.429	.....	.....	.....	9	110.330	.....	.....	.....
17.5	6	115.333	.....	.....	.....	4	109.250	.....	.....	.....
18.5	2	109.000	.....	.....	.....	....	.....	.....	.....	.....
19.5	2	114.500	.....	.....	.....	....	.....	.....	.....	.....
20.5	1	118.000	.....	.....	.....	....	.....	.....	.....	.....
Adult	4	112.000	.....	.....	.....	....	.....	.....	.....	.....

NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	107.000	.....	.....	.....	3	98.000	.....	.....	.....
6.5	21	99.667	5.008	.050	1.093	18	99.333	5.196	.052	1.225
7.5	34	103.441	3.994	.039	.685	29	99.621	4.641	.047	.862
8.5	33	103.061	4.911	.048	.855	38	100.763	4.331	.043	.703
9.5	49	103.020	4.766	.046	.681	31	102.000	4.174	.041	.750
10.5	50	104.760	4.456	.043	.630	28	103.000	3.635	.035	.687
11.5	40	105.750	4.974	.047	.786	21	104.762	4.628	.044	1.010
12.5	33	106.394	5.809	.055	1.011	41	105.366	4.041	.038	.631
13.5	37	106.892	5.326	.050	.876	41	107.585	4.778	.044	.746
14.5	38	109.395	5.393	.049	.875	49	107.918	5.236	.049	.748
15.5	38	109.868	5.141	.047	.837	41	108.585	4.510	.042	.704
16.5	23	110.435	4.020	.036	.838	35	109.486	4.319	.039	.730
17.5	17	111.529	3.882	.035	.942	26	108.615	5.956	.055	1.168
18.5	4	113.000	.....	.....	.....	13	111.385	4.306	.039	1.194
19.5	6	111.500	.....	.....	.....	5	113.600	.....	.....	.....
20.5	3	110.333	.....	.....	.....	1	104.000	.....	.....	.....
Adult	3	109.667	.....	.....	.....	12	106.667	4.905	.046	1.416

SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	....	.....	.....	.....	.....	1	97.000	.....	.....	.....
6.5	30	97.000	2.886	.030	.527	28	95.071	4.383	.046	.828
7.5	52	97.942	4.026	.041	.558	50	95.440	4.410	.046	.624
8.5	37	98.000	2.760	.028	.454	53	97.717	3.610	.037	.496
9.5	43	99.140	3.129	.032	.477	56	98.232	3.923	.040	.524
10.5	47	100.766	3.754	.037	.548	51	100.216	3.643	.036	.510
11.5	54	102.148	4.116	.040	.560	54	100.537	3.716	.037	.506
12.5	55	102.291	4.198	.041	.566	64	102.953	3.834	.037	.479
13.5	44	103.705	3.382	.033	.510	61	104.115	3.489	.034	.447
14.5	35	105.514	4.705	.045	.795	55	104.109	4.293	.041	.579
15.5	19	104.842	4.545	.043	1.043	40	105.150	3.651	.035	.577
16.5	12	108.833	3.387	.031	.978	29	105.621	3.242	.031	.602
17.5	7	107.429	.....	.....	.....	25	105.880	4.394	.041	.879
18.5	4	113.750	.....	.....	.....	8	106.374	.....	.....	.....
19.5	2	109.000	.....	.....	.....	8	106.000	.....	.....	.....
20.5	1	108.000	.....	.....	.....	4	106.000	.....	.....	.....
Adult	2	105.000	.....	.....	.....	2	106.000	.....	.....	.....

TABLE XIX. AGE CHANGES IN MINIMUM FRONTAL (IN MILLIMETERS), *continued*

HAWAIIAN-ASIATIC

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	2	96.500	.....	.....	.....	1	99.000	.....	.....	.....
6.5	23	98.782	5.116	.052	1.066	13	97.538	6.331	.065	1.756
7.5	34	100.705	5.539	.055	.949	33	98.394	3.781	.038	.658
8.5	36	102.467	5.038	.048	.839	38	99.711	3.892	.039	.631
9.5	32	101.562	3.571	.035	.631	42	100.714	4.252	.042	.656
10.5	39	102.821	5.272	.051	.844	37	102.081	3.968	.039	.652
11.5	25	105.640	3.610	.034	.722	25	104.760	5.107	.049	1.023
12.5	24	105.916	4.591	.043	.937	33	106.667	5.352	.050	.932
13.5	24	105.959	4.928	.046	1.005	33	106.697	4.274	.040	.744
14.5	27	107.259	5.828	.054	1.121	28	107.786	3.457	.032	.653
15.5	17	108.882	4.600	.042	1.115	21	108.619	4.541	.042	.991
16.5	8	113.120	.....	.....	.....	30	107.900	3.919	.036	.715
17.5	7	106.400	.....	.....	.....	15	109.000	5.228	.048	1.349
18.5	8	113.000	.....	.....	.....	15	108.200	4.182	.039	1.080
19.5	8	113.200	.....	.....	.....	8	109.375	.....	.....	.....
Adult	33	109.516	6.560	.060	1.142	30	105.334	4.580	.043	.836

HAWAIIAN-NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	99.000	.....	.....	.....	2	100.000	.....	.....	.....
6.5	25	99.760	4.320	.043	.864	20	99.400	3.441	.035	.769
7.5	33	100.394	4.599	.046	.801	36	99.805	4.377	.044	.729
8.5	47	101.872	3.547	.035	.517	38	100.447	3.816	.038	.619
9.5	36	102.167	4.936	.048	.823	47	101.255	4.265	.042	.622
10.5	45	102.911	4.060	.040	.605	47	103.872	4.494	.043	.655
11.5	57	104.018	3.909	.038	.517	54	104.556	4.241	.041	.577
12.5	46	105.500	5.199	.049	.766	35	107.314	5.418	.050	.916
13.5	41	106.683	4.791	.045	.748	57	106.404	5.255	.049	.696
14.5	40	108.400	5.700	.053	.901	50	108.160	4.369	.040	.617
15.5	31	108.549	4.831	.044	.868	53	108.000	3.752	.035	.515
16.5	31	109.581	5.296	.048	.951	38	108.842	4.510	.041	.732
17.5	19	112.895	4.090	.036	.938	37	108.189	3.992	.037	.656
18.5	18	112.500	3.305	.029	.778	25	109.080	4.533	.042	.907
19.5	13	114.539	5.017	.044	1.391	25	109.154	4.655	.043	1.291
Adult	70	109.357	5.026	.046	.601	79	106.924	4.357	.041	.490

HAWAIIAN-SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	100.000	.....	.....	.....	....	.....	.....	.....	.....
6.5	8	97.100	.....	.....	.....	4	96.250	.....	.....	.....
7.5	12	99.833	3.976	.040	1.147	13	100.231	3.599	.036	.998
8.5	19	100.264	4.700	.047	1.078	10	101.600	3.527	.035	1.115
9.5	21	102.953	3.811	.037	.832	16	100.438	2.872	.029	.718
10.5	16	103.250	5.344	.052	1.336	13	101.308	3.969	.039	1.101
11.5	21	105.524	3.923	.037	.856	18	102.000	3.727	.037	.878
12.5	12	105.250	4.165	.040	1.202	14	106.286	3.788	.036	1.012
13.5	18	104.945	4.904	.047	1.156	21	105.619	4.746	.045	1.035
14.5	7	110.142	.....	.....	.....	17	109.353	4.310	.039	1.045
15.5	12	107.417	4.537	.042	1.309	12	110.667	4.130	.037	1.192
16.5	5	106.200	.....	.....	.....	15	107.800	4.053	.038	1.046
17.5	3	107.000	.....	.....	.....	9	104.777	.....	.....	.....
18.5	5	110.800	.....	.....	.....	9	107.220	.....	.....	.....
Adult	19	111.368	6.666	.060	1.529	....	.....	.....	.....	.....

TABLE XIX. AGE CHANGES IN MINIMUM FRONTAL (IN MILLIMETERS), *continued*

HAWAIIAN-ASIATIC-EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	3	96.000	.....	.....	.....	3	96.330	.....	.....	.....
7.5	13	99.769	3.423	.034	.949	16	98.375	2.804	.029	.701
8.5	14	102.428	3.639	.036	.972	10	99.800	4.167	.042	1.318
9.5	11	105.091	4.601	.044	1.387	9	99.889	.....	.....	.....
10.5	12	101.667	4.589	.045	1.325	15	102.800	4.490	.044	1.159
11.5	11	104.091	3.942	.038	1.188	12	104.083	3.226	.031	.931
12.5	11	105.091	3.397	.032	1.024	12	104.917	4.699	.045	1.356
13.5	11	106.273	2.800	.026	.844	10	106.200	4.366	.041	1.381
14.5	12	109.167	2.672	.024	.771	16	107.563	3.640	.034	.910
15.5	4	109.750	.....	.....	.....	17	108.941	5.395	.049	1.309
16.5	10	112.600	.....	.....	.....	10	108.900	2.773	.025	.877
17.5	4	108.500	.....	.....	.....	10	109.400	5.919	.054	1.872
18.5	1	110.000	.....	.....	.....	2	107.500	.....	.....	.....
19.5	1	110.000	.....	.....	.....	3	109.667	.....	.....	.....
20.5	1	117.000	.....	.....	.....	5	105.800	.....	.....	.....

TABLE XX. AGE CHANGES IN FACE WIDTH (IN MILLIMETERS)

HAWAIIAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	9	118.000	.....	.....	.....	6	115.500	.....	.....	.....
7.5	19	120.790	3.941	.033	.904	28	117.035	4.760	.041	.899
8.5	28	121.214	3.857	.032	.728	36	120.972	4.512	.037	.752
9.5	29	122.897	3.899	.032	.724	19	122.105	5.342	.044	1.225
10.5	39	123.924	4.560	.037	.730	35	123.514	5.223	.042	.883
11.5	35	125.658	4.703	.037	.794	21	125.239	4.253	.034	.928
12.5	35	127.228	3.972	.031	.671	32	127.093	4.334	.034	.766
13.5	30	129.666	4.315	.033	.796	26	126.346	5.717	.045	1.121
14.5	35	131.771	4.734	.036	.800	34	129.794	4.472	.034	.766
15.5	20	134.095	4.442	.033	.993	27	131.556	3.593	.027	.691
16.5	16	136.562	4.650	.034	1.162	18	133.889	4.148	.031	.977
17.5	10	140.300	.....	.....	.....	24	134.084	4.600	.034	.938
18.5	7	137.857	.....	.....	.....	12	134.083	4.051	.030	1.169
19.5	1	140.400	.....	.....	.....	9	136.111	.....	.....	.....
Adult	206	144.500	6.105	.042	.425	175	136.982	5.057	.037	.382

CHINESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	5	116.000	.....	.....	.....	9	113.445	.....	.....	.....
6.5	48	118.813	3.919	.033	.489	37	117.649	4.035	.034	.663
7.5	82	119.756	3.738	.031	.413	77	117.195	4.055	.035	.462
8.5	70	120.400	4.019	.033	.480	61	117.951	3.956	.034	.507
9.5	76	122.263	4.336	.035	.497	73	120.630	4.781	.040	.560
10.5	73	123.068	4.295	.035	.503	67	121.777	4.986	.041	.609
11.5	79	123.987	5.278	.042	.594	55	124.455	5.474	.044	.738
12.5	57	127.456	4.892	.038	.648	67	126.254	4.672	.037	.571
13.5	66	129.106	5.108	.039	.629	55	127.182	5.338	.042	.720
14.5	68	131.353	6.055	.046	.734	69	129.594	5.295	.041	.637
15.5	48	134.250	6.156	.046	.888	56	131.714	5.077	.039	.678
16.5	45	136.111	4.859	.036	.724	43	132.791	4.925	.038	.751
17.5	36	137.667	4.582	.033	.764	38	133.632	5.112	.038	.829
18.5	30	138.300	5.014	.036	.915	14	134.286	3.347	.025	.894
19.5	10	140.800	3.280	.023	1.037	8	138.875	.....	.....	.....
20.5	8	138.000	.....	.....	.....	1	140.000	.....	.....	.....

TABLE XX. AGE CHANGES IN FACE WIDTH (IN MILLIMETERS), *continued*

JAPANESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	74	118.946	4.012	.034	.466	57	118.456	3.738	.031	.495
7.5	105	121.258	4.096	.034	.400	118	118.992	4.762	.040	.438
8.5	108	121.750	4.221	.035	.406	96	119.125	4.597	.038	.469
9.5	99	121.182	4.157	.034	.417	96	121.198	4.175	.034	.426
10.5	101	124.792	3.986	.032	.397	103	123.408	4.352	.035	.429
11.5	82	125.597	4.906	.039	.542	85	125.082	5.212	.042	.565
12.5	106	127.642	4.829	.038	.469	89	126.641	4.225	.033	.448
13.5	102	130.235	5.319	.041	.527	92	129.772	5.155	.040	.537
14.5	124	132.500	5.245	.040	.471	73	130.260	4.569	.035	.535
15.5	107	134.729	4.769	.035	.461	64	132.094	4.617	.035	.577
16.5	89	137.809	6.039	.044	.640	29	133.345	4.992	.037	.927
17.5	60	138.850	5.108	.037	.659	18	133.278	3.363	.025	.793
18.5	38	140.421	5.802	.041	.941	13	134.308	6.017	.045	1.669
19.5	15	137.733	4.523	.033	1.168	4	137.250	.....	.....	.....
20.5	15	136.867	3.947	.029	1.019	3	131.000	.....	.....	.....
Adult	10	142.000	.....	.....	.....	1	136.000	.....	.....	.....

KOREAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	4	119.500	.....	.....	.....	1	116.000	.....	.....	.....
6.5	4	124.750	.....	.....	.....	4	125.250	.....	.....	.....
7.5	7	121.286	.....	.....	.....	5	120.800	.....	.....	.....
8.5	6	121.833	.....	.....	.....	4	126.000	.....	.....	.....
9.5	8	127.125	.....	.....	.....	9	121.667	.....	.....	.....
10.5	13	125.308	3.517	.028	.975	6	126.450	.....	.....	.....
11.5	13	128.153	3.527	.028	.978	10	128.800	4.214	.033	1.333
12.5	15	131.467	5.239	.040	1.353	6	129.833	.....	.....	.....
13.5	14	130.857	5.515	.042	1.474	12	132.333	2.494	.019	.720
14.5	18	134.889	4.471	.033	1.054	10	135.900	3.300	.024	1.044
15.5	9	133.333	.....	.....	.....	22	134.727	4.433	.033	.945
16.5	7	140.143	.....	.....	.....	9	134.440	.....	.....	.....
17.5	6	139.667	.....	.....	.....	4	136.500	.....	.....	.....
18.5	2	139.500	.....	.....	.....	....	.....	.....	.....	.....
19.5	2	143.000	.....	.....	.....	....	.....	.....	.....	.....
20.5	1	132.000	.....	.....	.....	....	.....	.....	.....	.....
Adult	4	148.000	.....	.....	.....	....	.....	.....	.....	.....

NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	119.000	.....	.....	.....	3	112.333	.....	.....	.....
6.5	21	115.238	4.374	.038	.954	18	113.778	4.341	.038	1.023
7.5	34	118.294	3.651	.031	.626	29	113.448	4.239	.037	.787
8.5	33	118.242	4.335	.037	.755	38	116.368	4.487	.039	.728
9.5	49	119.694	4.253	.036	.608	31	117.742	5.086	.043	.913
10.5	50	120.380	4.299	.036	.608	28	120.071	3.900	.032	.737
11.5	40	123.425	4.949	.040	.782	21	122.762	4.363	.036	.952
12.5	33	123.727	4.461	.036	.777	40	123.200	3.572	.029	.565
13.5	37	125.135	4.933	.039	.811	41	125.415	5.002	.040	.781
14.5	38	128.368	5.927	.046	.962	49	125.939	5.285	.042	.755
15.5	38	130.658	5.469	.042	.887	42	126.548	5.225	.041	.806
16.5	23	132.087	4.662	.035	.972	35	127.457	4.674	.037	.790
17.5	16	134.250	4.657	.035	1.164	26	127.692	5.689	.045	1.116
18.5	4	132.000	.....	.....	.....	12	127.833	4.723	.037	1.363
19.5	6	133.667	.....	.....	.....	5	128.400	.....	.....	.....
20.5	4	130.000	.....	.....	.....	1	124.000	.....	.....	.....
Adult	3	137.667	.....	.....	.....	12	133.083	.....	.....	.....

TABLE XX. AGE CHANGES IN FACE WIDTH (IN MILLIMETERS), *continued*

SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	....	.....	.....	.....	.....	1	114.000	.....	.....	.....
6.5	30	113.767	3.695	.032	.675	28	111.429	4.452	.040	.841
7.5	52	115.385	4.490	.039	.623	50	111.660	3.674	.033	.520
8.5	37	114.838	3.760	.033	.618	53	114.094	4.301	.038	.591
9.5	43	116.535	3.842	.033	.586	56	115.500	3.960	.034	.529
10.5	47	118.383	4.831	.041	.705	51	117.569	4.290	.036	.601
11.5	54	119.593	3.629	.030	.494	54	117.926	4.082	.035	.556
12.5	55	120.564	3.869	.032	.522	64	121.328	4.988	.041	.624
13.5	44	122.864	5.048	.041	.761	61	122.918	3.770	.031	.483
14.5	35	125.143	3.929	.031	.664	55	125.600	4.894	.039	.660
15.5	19	124.789	4.162	.033	.955	40	126.225	3.601	.029	.569
16.5	12	129.083	5.485	.042	1.583	29	126.897	5.713	.045	1.061
17.5	7	132.286	.....	.....	.....	25	128.160	5.049	.039	1.010
18.5	4	135.000	.....	.....	.....	8	128.875	.....	.....	.....
19.5	2	131.500	.....	.....	.....	8	128.625	.....	.....	.....
20.5	1	127.000	.....	.....	.....	4	124.500	.....	.....	.....
Adult	2	133.000	.....	.....	.....	2	133.000	.....	.....	.....

HAWAIIAN-ASIATIC

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	2	113.500	.....	.....	.....	1	118.000	.....	.....	.....
6.5	23	117.957	4.288	.036	.894	13	116.539	5.569	.048	1.544
7.5	34	120.382	4.051	.034	.694	33	117.727	4.322	.037	.752
8.5	36	121.444	4.687	.038	.781	38	119.816	4.272	.036	.693
9.5	32	122.094	4.231	.035	.747	42	121.261	4.572	.038	.706
10.5	39	123.846	4.775	.038	.764	37	122.459	4.259	.035	.700
11.5	25	124.920	4.222	.034	.844	25	126.360	4.353	.034	.871
12.5	24	127.960	4.392	.034	.896	33	127.939	5.537	.043	.964
13.5	24	128.917	4.453	.034	.908	33	129.333	5.850	.045	1.018
14.5	27	130.814	6.266	.048	1.205	28	129.929	3.442	.027	.651
15.5	17	133.883	5.086	.038	1.233	21	133.571	5.924	.044	1.292
16.5	8	138.700	.....	.....	.....	30	133.567	4.580	.034	.836
17.5	7	139.100	.....	.....	.....	15	134.866	4.303	.032	1.111
18.5	8	138.300	.....	.....	.....	15	133.800	4.085	.031	1.054
19.5	8	142.000	.....	.....	.....	8	136.375	.....	.....	.....
Adult	33	143.607	5.428	.038	.944	30	134.500	5.052	.038	.922

HAWAIIAN-NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	118.000	.....	.....	.....	2	114.000	.....	.....	.....
6.5	25	117.160	3.695	.032	.739	20	116.050	2.693	.023	.602
7.5	33	118.939	5.694	.048	.991	36	116.027	4.524	.039	.754
8.5	47	120.404	4.134	.034	.603	38	117.842	3.167	.027	.514
9.5	36	122.056	5.745	.047	.958	47	118.468	4.321	.036	.630
10.5	45	121.911	4.436	.036	.661	47	122.064	4.531	.037	.661
11.5	57	124.000	4.970	.040	.658	54	122.796	4.301	.035	.585
12.5	46	125.848	4.859	.039	.716	35	125.257	3.945	.031	.667
13.5	41	127.366	4.792	.038	.748	57	127.281	5.011	.039	.664
14.5	40	130.125	5.823	.045	.921	50	128.580	4.866	.038	.688
15.5	31	130.484	4.970	.038	.893	53	129.906	4.284	.033	.588
16.5	31	133.678	5.888	.044	1.057	38	130.000	5.587	.043	.906
17.5	19	137.842	5.441	.039	1.248	37	131.946	5.067	.038	.833
18.5	18	136.889	3.740	.027	.881	25	131.160	5.449	.042	1.090
19.5	13	137.846	4.833	.035	1.340	13	132.077	5.484	.042	1.521
Adult	70	142.857	6.294	.044	.752	79	135.316	5.237	.039	.589

TABLE XX. AGE CHANGES IN FACE WIDTH (IN MILLIMETERS), *continued*

HAWAIIAN-SOUTH EUROPEAN

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	108.000	.....	.....	.....	....	.....	.....	.....	.....
6.5	8	113.625	.....	.....	.....	4	110.750	.....	.....	.....
7.5	11	116.545	3.726	.032	1.123	13	116.077	2.496	.022	.692
8.5	19	119.053	3.804	.032	.873	10	116.700	2.968	.025	.939
9.5	21	121.714	4.244	.035	.926	16	117.813	4.141	.035	1.035
10.5	16	122.375	5.207	.043	1.302	13	120.462	5.109	.042	1.416
11.5	21	125.762	5.042	.040	1.100	18	121.555	4.634	.038	1.092
12.5	12	124.833	5.226	.042	1.508	14	121.714	5.091	.041	1.361
13.5	18	126.722	5.998	.047	1.413	21	124.191	5.612	.045	1.224
14.5	7	132.142	.....	.....	.....	17	131.059	2.623	.020	.636
15.5	12	130.500	4.610	.035	1.330	12	132.833	4.670	.035	1.348
16.5	5	130.400	.....	.....	.....	15	130.600	4.394	.034	1.134
17.5	3	138.300	.....	.....	.....	9	131.777	.....	.....	.....
18.5	5	135.200	.....	.....	.....	9	131.666	.....	.....	.....
Adult	19	144.210	7.572	.052	1.737	....	.....	.....	.....	.....

HAWAIIAN-ASIATIC-EUROPEAN

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	3	115.000	.....	.....	.....	3	110.660	.....	.....	.....
7.5	13	117.769	2.516	.021	.698	16	115.937	3.230	.028	.808
8.5	14	120.428	5.067	.042	1.354	10	118.000	3.633	.031	1.149
9.5	11	123.636	2.773	.022	.836	9	120.000	.....	.....	.....
10.5	12	121.583	4.769	.039	1.377	15	120.933	4.025	.033	1.039
11.5	11	124.273	4.653	.037	1.402	12	125.000	2.707	.022	.781
12.5	11	128.000	4.285	.033	1.292	12	126.333	5.483	.043	1.583
13.5	11	127.546	3.603	.028	1.086	10	126.500	5.696	.045	1.801
14.5	12	129.667	4.870	.038	1.406	16	130.687	4.440	.034	1.110
15.5	4	133.150	.....	.....	.....	17	132.118	4.934	.037	1.197
16.5	9	137.778	.....	.....	.....	10	134.600	4.543	.034	1.437
17.5	4	136.750	.....	.....	.....	10	133.700	3.743	.028	1.183
18.5	1	135.000	.....	.....	.....	2	134.500	.....	.....	.....
19.5	1	141.000	.....	.....	.....	3	136.000	.....	.....	.....
20.5	1	134.000	.....	.....	.....	1	138.000	.....	.....	.....
Adult	....	.....	.....	.....	.....	4	133.000	.....	.....	.....

TABLE XXI. AGE CHANGES IN ZYGOMATICO-FRONTAL INDEX

HAWAIIAN

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	9	84.880	.....	.....	.....	6	85.333	.....	.....	.....
7.5	19	82.578	2.602	.032	.596	28	84.428	2.970	.035	.561
8.5	28	84.214	3.298	.039	.623	36	83.333	2.778	.033	.463
9.5	29	82.759	2.944	.036	.546	19	83.316	4.461	.054	1.023
10.5	39	83.436	3.061	.037	.490	35	83.000	2.596	.031	.438
11.5	35	82.829	3.028	.036	.511	21	83.238	3.038	.036	.663
12.5	35	82.086	3.418	.042	.577	32	82.438	2.345	.028	.414
13.5	30	81.767	2.664	.033	.492	26	83.731	3.460	.041	.678
14.5	35	82.371	2.427	.029	.410	34	82.353	3.161	.038	.542
15.5	20	81.550	3.202	.039	.716	27	81.814	2.750	.034	.529
16.5	16	78.875	3.391	.043	.848	18	80.222	2.594	.032	.611
17.5	10	78.500	.....	.....	.....	24	80.542	2.328	.029	.475
18.5	7	80.285	.....	.....	.....	12	81.833	2.577	.032	.744
19.5	5	77.600	.....	.....	.....	9	77.555	.....	.....	.....
Adult	205	74.731	3.315	.044	.231	175	77.452	3.068	.040	.231

TABLE XXI. AGE CHANGES IN ZYGOMATICO-FRONTAL INDEX, *continued*

CHINESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	5	81.200	.....	.....	.....	9	80.555	.....	.....	.....
6.5	49	82.653	4.410	.053	.630	37	81.189	3.812	.047	.627
7.5	82	82.378	3.248	.039	.359	77	83.000	2.663	.032	.303
8.5	70	82.329	3.027	.037	.362	61	82.574	3.356	.041	.430
9.5	76	82.987	2.592	.031	.297	73	82.849	3.059	.037	.358
10.5	73	82.658	2.655	.032	.311	67	82.955	2.825	.034	.345
11.5	79	81.848	2.787	.034	.313	55	82.473	3.097	.038	.418
12.5	57	82.140	3.353	.041	.444	67	81.716	2.832	.035	.346
13.5	66	81.682	2.646	.032	.326	55	82.491	3.458	.042	.466
14.5	68	81.603	2.987	.037	.362	69	82.188	2.841	.035	.342
15.5	49	81.122	3.268	.039	.467	56	80.982	2.709	.033	.362
16.5	45	80.200	3.202	.040	.477	43	82.140	1.947	.024	.297
17.5	36	81.028	3.593	.044	.599	38	81.132	3.036	.037	.493
18.5	30	80.533	3.041	.038	.555	14	79.643	1.797	.023	.480
19.5	10	78.800	2.713	.034	.858	8	81.875	.....	.....	.....
20.5	8	80.250	.....	.....	.....	1	83.600	.....	.....	.....

JAPANESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	74	81.230	4.336	.053	.504	57	80.790	4.336	.054	.574
7.5	105	81.715	3.051	.037	.298	118	82.458	3.813	.046	.351
8.5	108	82.704	2.954	.036	.284	96	82.896	3.111	.037	.318
9.5	99	82.404	2.429	.029	.244	96	82.833	2.581	.031	.263
10.5	101	82.148	2.676	.032	.266	103	82.680	2.832	.034	.279
11.5	82	82.110	2.858	.035	.316	85	82.435	3.023	.037	.328
12.5	106	81.991	2.867	.035	.278	89	82.427	2.672	.032	.283
13.5	102	80.667	3.069	.038	.304	92	82.174	2.780	.034	.290
14.5	124	81.758	2.818	.034	.253	73	82.493	2.670	.032	.313
15.5	107	81.411	2.825	.035	.273	64	82.031	2.173	.026	.272
16.5	89	80.551	2.768	.034	.293	29	81.931	3.151	.038	.585
17.5	60	80.583	2.951	.037	.381	18	81.667	2.404	.029	.567
18.5	38	79.263	3.461	.044	.561	13	81.000	3.981	.049	1.104
19.5	15	80.667	2.119	.026	.547	4	80.325	.....	.....	.....
20.5	15	81.133	3.222	.040	.832	3	83.500	.....	.....	.....
Adult	10	77.700	.....	.....	.....	1	85.300	.....	.....	.....

KOREAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	4	81.450	.....	.....	.....	1	78.450	.....	.....	.....
6.5	4	80.850	.....	.....	.....	4	81.082	.....	.....	.....
7.5	7	82.071	.....	.....	.....	5	80.474	.....	.....	.....
8.5	6	83.433	.....	.....	.....	4	83.122	.....	.....	.....
9.5	8	82.488	.....	.....	.....	9	83.740	.....	.....	.....
10.5	13	83.000	2.449	.030	.679	6	82.150	.....	.....	.....
11.5	13	81.462	2.650	.033	.735	10	82.400	2.059	.025	.651
12.5	15	81.533	2.872	.035	.742	6	83.550	.....	.....	.....
13.5	14	82.143	3.523	.043	.941	12	83.333	2.358	.028	.681
14.5	18	82.778	1.960	.024	.462	10	84.000	3.098	.037	.980
15.5	9	81.300	.....	.....	.....	22	82.455	3.265	.040	.696
16.5	7	80.957	.....	.....	.....	9	82.110	.....	.....	.....
17.5	6	82.583	.....	.....	.....	4	80.025	.....	.....	.....
18.5	2	78.100	.....	.....	.....	....	.....	.....	.....	.....
19.5	2	80.350	.....	.....	.....	....	.....	.....	.....	.....
20.5	1	83.333	.....	.....	.....	....	.....	.....	.....	.....
Adult	4	75.750	.....	.....	.....	....	.....	.....	.....	.....

TABLE XXI. AGE CHANGES IN ZYGOMATICO-FRONTAL INDEX, *continued*

NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	89.900	.....	.....	.....	3	87.233	.....	.....	.....
6.5	21	86.429	3.048	.035	.665	18	87.500	3.005	.034	.708
7.5	34	87.471	3.211	.037	.551	29	87.828	2.613	.030	.485
8.5	33	87.152	3.239	.037	.564	38	86.658	2.931	.034	.476
9.5	49	86.082	2.941	.034	.420	31	86.710	2.542	.029	.457
10.5	50	87.100	2.886	.033	.408	28	85.857	2.445	.028	.462
11.5	40	85.775	2.524	.029	.399	21	85.476	2.855	.033	.623
12.5	33	85.939	3.499	.041	.609	40	85.450	2.510	.029	.397
13.5	37	85.405	3.158	.037	.519	41	85.829	2.963	.035	.463
14.5	38	85.316	2.929	.034	.475	49	85.755	2.960	.035	.423
15.5	38	84.105	3.153	.037	.512	41	85.854	3.273	.038	.511
16.5	23	83.870	2.542	.030	.530	35	85.800	3.233	.038	.546
17.5	16	83.063	3.381	.041	.845	26	85.115	2.860	.034	.561
18.5	4	85.550	.....	.....	.....	12	87.417	2.956	.034	.853
19.5	6	83.450	.....	.....	.....	5	88.800	.....	.....	.....
20.5	3	85.933	.....	.....	.....	1	83.900	.....	.....	.....
Adult	3	79.700	.....	.....	.....	12	80.333	3.197	.040	.923

SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	....	.....	.....	.....	.....	1	85.090	.....	.....	.....
6.5	30	85.167	2.621	.031	.479	28	85.500	2.872	.034	.543
7.5	52	84.846	2.291	.027	.318	49	85.816	2.047	.024	.292
8.5	37	85.432	2.757	.032	.453	53	85.660	2.526	.029	.347
9.5	43	85.163	3.027	.036	.462	56	85.232	2.458	.029	.328
10.5	47	85.191	2.965	.035	.431	51	85.255	2.573	.030	.360
11.5	54	85.426	3.223	.038	.439	54	85.167	2.508	.029	.341
12.5	55	84.800	2.339	.028	.315	64	84.906	3.156	.037	.395
13.5	44	84.500	2.934	.035	.442	61	84.689	2.161	.026	.277
14.5	35	84.286	2.825	.034	.478	55	82.945	2.512	.030	.339
15.5	19	84.105	2.955	.035	.678	40	83.325	2.184	.026	.345
16.5	12	84.500	3.202	.038	.924	29	83.345	3.397	.041	.631
17.5	7	81.286	.....	.....	.....	25	82.640	2.381	.029	.476
18.5	4	84.225	.....	.....	.....	8	82.571	.....	.....	.....
19.5	2	82.940	.....	.....	.....	8	83.192	.....	.....	.....
20.5	1	85.040	.....	.....	.....	4	83.045	.....	.....	.....
Adult	2	79.000	.....	.....	.....	2	79.710	.....	.....	.....

HAWAIIAN-ASIATIC

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	2	85.000	.....	.....	.....	1	83.900	.....	.....	.....
6.5	23	83.783	3.451	.041	.719	13	83.000	4.279	.052	1.187
7.5	34	83.647	3.333	.040	.571	33	83.576	3.455	.041	.601
8.5	36	84.139	3.038	.036	.506	38	83.184	2.955	.036	.479
9.5	32	83.312	2.909	.035	.514	42	82.905	3.442	.042	.531
10.5	39	83.077	3.076	.037	.492	37	83.352	2.486	.030	.409
11.5	25	84.640	2.798	.033	.560	25	82.880	3.457	.042	.691
12.5	24	82.750	2.890	.035	.590	33	83.242	3.046	.037	.530
13.5	24	82.125	2.650	.032	.540	33	82.242	2.955	.036	.514
14.5	27	82.037	3.716	.045	.715	28	82.893	2.919	.035	.552
15.5	17	81.412	2.809	.034	.681	21	81.333	2.713	.033	.592
16.5	8	82.750	.....	.....	.....	30	80.767	2.027	.025	.370
17.5	7	76.500	.....	.....	.....	15	80.934	3.605	.045	.931
18.5	8	81.740	.....	.....	.....	15	80.734	2.731	.034	.705
19.5	8	79.660	.....	.....	.....	8	80.200	.....	.....	.....
Adult	33	76.394	5.268	.069	.917	30	78.400	3.323	.042	.606

TABLE XXI. AGE CHANGES IN ZYGOMATICO-FRONTAL INDEX, *continued*

HAWAIIAN-NORTH EUROPEAN

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	83.900	.....	.....	.....	2	87.500	.....	.....	.....
6.5	25	85.120	2.862	.034	.572	20	85.750	2.577	.030	.576
7.5	33	85.394	3.219	.038	.560	36	85.861	2.530	.029	.422
8.5	47	84.660	2.807	.033	.409	38	85.289	2.874	.034	.466
9.5	36	83.722	2.387	.029	.398	47	85.489	2.551	.030	.372
10.5	45	84.444	3.145	.037	.469	47	85.128	2.670	.031	.389
11.5	57	83.877	2.676	.032	.354	54	85.166	2.486	.029	.338
12.5	46	83.891	3.205	.038	.472	35	85.257	3.074	.036	.520
13.5	41	83.732	2.490	.030	.388	57	83.596	3.094	.037	.410
14.5	40	83.450	3.369	.040	.532	50	84.120	2.820	.034	.399
15.5	31	83.291	3.795	.046	.682	53	83.189	2.795	.034	.384
16.5	31	82.032	2.740	.033	.492	38	83.737	2.874	.034	.466
17.5	19	82.000	2.615	.032	.600	37	82.162	3.285	.040	.540
18.5	18	82.167	2.651	.032	.625	25	83.360	3.908	.047	.782
19.5	13	83.077	3.100	.037	.860	13	82.692	3.266	.039	.906
Adult	70	76.700	3.654	.048	.437	79	79.127	3.491	.044	.393

HAWAIIAN-SOUTH EUROPEAN

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	92.600	.....	.....	.....	....	.....	.....	.....	.....
6.5	8	85.462	.....	.....	.....	4	87.000	.....	.....	.....
7.5	12	83.500	5.252	.063	1.516	13	86.462	2.309	.027	.640
8.5	19	85.105	3.041	.036	.698	10	87.300	2.326	.027	.735
9.5	21	84.619	2.733	.032	.596	16	85.375	2.369	.028	.592
10.5	16	84.250	3.288	.039	.822	13	84.154	3.279	.039	.909
11.5	21	84.048	3.170	.038	.692	18	83.944	2.369	.028	.558
12.5	12	84.417	2.900	.034	.837	14	85.357	3.038	.036	.811
13.5	18	82.889	3.365	.041	.793	21	84.477	2.423	.029	.529
14.5	7	83.414	.....	.....	.....	17	83.412	3.002	.036	.728
15.5	12	82.417	2.843	.034	.821	12	83.250	1.640	.020	.473
16.5	5	81.460	.....	.....	.....	15	82.667	2.272	.028	.587
17.5	3	77.460	.....	.....	.....	9	79.564	.....	.....	.....
18.5	5	82.000	.....	.....	.....	9	81.468	.....	.....	.....
Adult	19	77.263	3.400	.044	.780	....	.....	.....	.....	.....

HAWAIIAN-ASIATIC-EUROPEAN

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	3	83.444	.....	.....	.....	3	87.033	.....	.....	.....
7.5	13	84.615	3.127	.037	.867	16	85.000	2.717	.032	.679
8.5	14	85.071	2.865	.034	.766	10	84.500	2.335	.028	.738
9.5	11	83.455	2.536	.030	.764	9	83.078	.....	.....	.....
10.5	12	83.583	1.892	.023	.546	15	84.867	2.825	.033	.729
11.5	11	83.727	3.018	.036	.910	12	83.417	1.606	.019	.464
12.5	11	82.182	2.891	.033	.811	12	83.000	3.742	.045	1.080
13.5	11	83.454	2.272	.027	.684	10	83.900	3.081	.037	.974
14.5	12	86.250	3.032	.035	.875	16	82.000	2.526	.031	.632
15.5	4	82.400	.....	.....	.....	17	82.824	3.501	.042	.849
16.5	9	81.644	.....	.....	.....	10	81.100	1.868	.023	.591
17.5	4	79.375	.....	.....	.....	10	81.900	3.740	.045	1.183
18.5	1	81.500	.....	.....	.....	2	80.100	.....	.....	.....
19.5	1	78.000	.....	.....	.....	3	80.667	.....	.....	.....
20.5	1	87.300	.....	.....	.....	1	79.700	.....	.....	.....
Adult	....	.....	.....	.....	.....	4	78.825	.....	.....	.....

TABLE XXII. AGE CHANGES IN BIGONIAL WIDTH (IN MILLIMETERS)

HAWAIIAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	9	91.330	.....	.....	.....	6	88.833	.....	.....	.....
7.5	19	92.421	3.924	.042	.900	28	89.608	3.559	.040	.672
8.5	28	93.750	4.171	.044	.788	36	93.556	4.051	.043	.675
9.5	29	95.759	3.730	.039	.692	19	95.474	4.417	.046	1.013
10.5	39	95.949	4.237	.044	.678	35	95.428	4.045	.042	.683
11.5	35	97.057	4.696	.048	.793	21	97.095	3.728	.038	.813
12.5	35	98.600	5.083	.052	.859	32	98.875	4.307	.044	.761
13.5	30	99.300	5.472	.055	.999	27	97.629	4.997	.051	.961
14.5	35	102.571	4.795	.047	.810	34	99.558	4.460	.045	.764
15.5	20	101.900	3.884	.038	.868	27	99.778	4.717	.047	.907
16.5	16	107.063	6.466	.060	1.616	18	101.612	4.668	.046	1.100
17.5	10	106.700	.....	.....	.....	24	103.125	4.334	.042	.884
18.5	7	106.285	.....	.....	.....	12	101.000	3.785	.037	1.092
19.5	5	106.400	.....	.....	.....	9	99.555	.....	.....	.....
Adult	205	111.176	5.876	.053	.410	175	104.851	6.127	.058	.463

CHINESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	5	87.200	.....	.....	.....	9	85.889	.....	.....	.....
6.5	40	89.612	4.466	.050	.638	37	89.405	3.752	.042	.617
7.5	82	91.000	4.347	.048	.480	77	90.208	3.795	.042	.432
8.5	70	91.643	4.404	.048	.526	61	91.869	4.237	.046	.543
9.5	76	94.553	4.688	.050	.538	73	93.041	3.772	.041	.441
10.5	73	95.699	4.140	.043	.484	67	93.552	5.160	.055	.630
11.5	79	95.785	4.852	.051	.546	55	95.927	5.117	.053	.690
12.5	57	98.369	5.115	.052	.677	67	97.164	4.836	.050	.591
13.5	66	100.076	5.335	.053	.657	55	98.400	5.545	.056	.748
14.5	68	101.780	5.324	.052	.646	69	99.551	5.676	.057	.683
15.5	49	103.347	5.622	.054	.803	56	102.232	5.389	.053	.720
16.5	45	106.089	5.055	.048	.753	43	101.930	5.667	.056	.864
17.5	36	107.194	4.892	.046	.815	38	101.658	5.886	.058	.955
18.5	30	109.367	4.453	.041	.813	14	101.143	4.518	.045	1.207
19.5	10	110.800	2.786	.025	.881	8	106.250	.....	.....	.....
20.5	8	107.875	.....	.....	.....	1	108.000	.....	.....	.....

JAPANESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	74	91.459	3.746	.041	.435	57	89.351	5.219	.058	.691
7.5	105	92.477	4.289	.046	.418	119	91.597	4.298	.047	.394
8.5	108	94.462	4.129	.044	.397	96	92.219	4.260	.046	.435
9.5	99	94.545	4.038	.043	.406	96	94.052	4.634	.049	.473
10.5	101	96.871	4.279	.044	.426	103	95.058	4.317	.045	.425
11.5	82	97.232	4.272	.044	.472	85	96.576	4.754	.049	.516
12.5	106	98.057	5.570	.057	.541	89	98.427	4.347	.044	.461
13.5	102	100.510	5.799	.057	.574	92	99.837	5.074	.051	.529
14.5	124	101.693	5.712	.056	.513	73	99.274	4.860	.049	.569
15.5	107	104.224	5.041	.048	.487	64	100.969	6.144	.061	.768
16.5	89	106.123	5.287	.050	.560	29	102.621	4.951	.048	.919
17.5	60	107.650	5.316	.049	.686	18	102.778	4.951	.048	1.167
18.5	38	108.210	5.212	.048	.845	13	104.385	5.047	.048	1.400
19.5	15	108.467	5.512	.051	1.423	4	105.250	.....	.....	.....
20.5	15	108.267	5.053	.047	1.305	3	97.333	.....	.....	.....
Adult	10	112.000	.....	.....	.....	1	100.000	.....	.....	.....

TABLE XXII. AGE CHANGES IN BIGONIAL WIDTH (IN MILLIMETERS), *continued*

KOREAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	4	90.750	.....	.....	.....	1	86.000	.....	.....	.....
6.5	4	92.750	.....	.....	.....	4	90.750	.....	.....	.....
7.5	7	90.857	.....	.....	.....	5	90.600	.....	.....	.....
8.5	6	94.333	.....	.....	.....	4	94.750	.....	.....	.....
9.5	8	99.375	.....	.....	.....	9	93.667	.....	.....	.....
10.5	13	97.077	4.891	.050	1.356	6	97.500	.....	.....	.....
11.5	13	99.231	3.886	.039	1.078	10	99.800	3.709	.037	1.173
12.5	15	103.200	4.400	.043	1.136	6	103.167	.....	.....	.....
13.5	14	101.143	3.700	.037	.989	12	105.167	3.262	.031	.942
14.5	18	106.556	4.598	.043	1.084	10	106.700	3.523	.033	1.114
15.5	9	103.888	.....	.....	.....	22	107.045	5.022	.047	1.071
16.5	7	109.571	.....	.....	.....	9	107.770	.....	.....	.....
17.5	6	108.667	.....	.....	.....	4	107.250	.....	.....	.....
18.5	2	110.500	.....	.....	.....	....	.....	.....	.....	.....
19.5	2	112.500	.....	.....	.....	....	.....	.....	.....	.....
20.5	1	100.000	.....	.....	.....	....	.....	.....	.....	.....
Adult	4	114.750	.....	.....	.....	....	.....	.....	.....	.....

NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	94.000	.....	.....	.....	3	89.333	.....	.....	.....
6.5	20	89.500	2.802	.031	.627	18	86.722	4.616	.053	1.088
7.5	34	91.294	3.527	.039	.605	29	87.034	3.567	.041	.662
8.5	33	91.242	4.586	.050	.798	38	90.211	4.034	.045	.654
9.5	49	91.796	4.426	.048	.632	31	90.065	4.479	.050	.804
10.5	50	92.580	3.628	.039	.513	28	92.357	4.377	.047	.827
11.5	40	95.300	4.562	.048	.721	21	93.048	3.684	.040	.804
12.5	33	95.667	4.261	.045	.742	41	94.512	4.479	.047	.700
13.5	37	97.486	4.397	.045	.723	41	96.415	5.132	.053	.801
14.5	38	99.289	6.316	.064	1.025	49	96.898	4.892	.050	.699
15.5	38	101.711	4.871	.048	.790	42	97.810	5.889	.060	.909
16.5	23	101.174	3.306	.033	.689	35	97.629	5.227	.054	.884
17.5	17	103.294	4.011	.039	.973	26	98.192	5.609	.057	1.100
18.5	4	109.250	.....	.....	.....	13	97.231	4.135	.043	1.147
19.5	6	105.167	.....	.....	.....	5	98.600	.....	.....	.....
20.5	4	101.250	.....	.....	.....	1	95.000	.....	.....	.....
Adult	3	107.667	.....	.....	.....	12	102.417	4.821	.047	1.392

SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	....	.....	.....	.....	.....	1	88.000	.....	.....	.....
6.5	30	86.733	3.803	.044	.694	28	84.750	5.468	.065	1.033
7.5	52	87.481	4.272	.049	.592	50	85.640	4.112	.048	.582
8.5	37	87.135	4.062	.047	.668	53	86.245	4.638	.054	.637
9.5	43	88.860	3.612	.041	.551	56	88.732	4.835	.054	.646
10.5	47	90.213	4.529	.050	.661	51	89.804	3.966	.044	.555
11.5	54	90.778	4.230	.047	.576	54	90.185	4.101	.045	.558
12.5	55	91.545	5.225	.057	.705	64	91.703	5.453	.059	.682
13.5	44	93.227	6.146	.066	.927	61	93.098	4.978	.053	.637
14.5	35	94.743	4.449	.047	.752	55	95.218	6.116	.064	.825
15.5	19	96.789	5.105	.053	1.171	40	94.400	5.603	.059	.886
16.5	12	99.583	5.377	.054	1.552	29	96.172	6.114	.064	1.135
17.5	7	101.857	.....	.....	.....	25	97.040	4.678	.048	.936
18.5	4	105.250	.....	.....	.....	8	98.250	.....	.....	.....
19.5	2	100.000	.....	.....	.....	8	100.625	.....	.....	.....
20.5	1	98.000	.....	.....	.....	4	90.250	.....	.....	.....
Adult	2	101.000	.....	.....	.....	2	98.500	.....	.....	.....

TABLE XXII. AGE CHANGES IN BIGONIAL WIDTH (IN MILLIMETERS), *continued*

HAWAIIAN-ASIATIC

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	2	83.500	.....	.....	.....	1	96.000	.....	.....	.....
6.5	23	89.434	2.717	.030	.566	13	89.000	3.843	.043	1.066
7.5	34	92.824	4.062	.044	.696	33	89.727	3.686	.041	.641
8.5	36	93.306	3.831	.041	.639	38	92.737	3.453	.037	.560
9.5	32	93.594	4.077	.044	.720	42	92.762	4.592	.050	.709
10.5	39	94.898	5.537	.058	.886	37	93.865	5.292	.056	.870
11.5	25	96.840	4.522	.047	.904	25	97.680	3.283	.034	.657
12.5	24	98.834	3.727	.038	.760	33	97.818	4.988	.051	.868
13.5	24	100.125	4.447	.044	.907	33	99.000	5.494	.056	.956
14.5	27	101.185	5.767	.057	1.109	28	99.393	4.514	.045	.853
15.5	17	103.471	4.367	.042	1.059	21	102.714	5.274	.051	1.151
16.5	8	107.620	.....	.....	.....	30	101.934	5.573	.055	1.217
17.5	7	105.000	.....	.....	.....	15	101.934	3.376	.033	.872
18.5	8	106.600	.....	.....	.....	15	100.133	4.674	.047	1.207
19.5	8	106.880	.....	.....	.....	8	101.000	.....	.....	.....
Adult	33	108.393	6.506	.060	1.132	30	102.333	5.375	.052	.981

HAWAIIAN-NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	95.000	.....	.....	.....	2	86.000	.....	.....	.....
6.5	25	90.080	4.706	.052	.941	20	88.700	4.394	.050	.983
7.5	33	91.182	5.644	.062	.982	36	89.306	4.221	.047	.704
8.5	47	92.277	3.740	.041	.546	38	89.763	3.422	.038	.555
9.5	36	93.583	4.639	.050	.773	47	90.766	4.111	.045	.600
10.5	45	93.489	3.650	.039	.544	47	93.702	4.453	.048	.650
11.5	57	95.632	4.195	.044	.555	54	94.389	4.478	.047	.609
12.5	47	96.468	4.247	.044	.619	35	96.714	5.012	.052	.847
13.5	41	97.098	4.167	.043	.651	57	97.684	4.260	.044	.564
14.5	40	100.575	5.238	.052	.828	50	98.780	4.797	.049	.678
15.5	31	100.032	4.307	.043	.773	53	98.868	4.443	.045	.610
16.5	31	103.484	5.430	.052	.975	38	98.737	4.733	.048	.768
17.5	19	105.790	6.429	.061	1.474	37	101.568	5.558	.055	.914
18.5	18	106.278	4.735	.044	1.115	25	99.880	4.358	.044	.872
19.5	13	105.231	4.022	.038	1.115	13	99.692	5.105	.051	1.416
Adult	70	110.457	6.249	.057	.747	79	102.443	5.054	.049	.569

HAWAIIAN-SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	79.000	.....	.....	.....	....	.....	.....	.....	.....
6.5	8	89.000	.....	.....	.....	4	80.250	.....	.....	.....
7.5	12	90.500	4.031	.045	1.163	13	89.385	2.704	.030	.749
8.5	19	91.579	5.333	.058	1.223	10	90.800	3.059	.034	.999
9.5	21	94.333	4.280	.045	.934	16	87.500	3.103	.035	.775
10.5	16	93.812	4.475	.048	1.118	13	93.615	3.971	.042	1.101
11.5	21	96.762	5.308	.055	1.158	18	94.722	4.665	.049	1.099
12.5	12	95.834	4.845	.051	1.398	14	95.142	4.224	.044	1.128
13.5	18	97.000	4.460	.046	1.051	21	95.381	5.956	.062	1.299
14.5	7	99.714	.....	.....	.....	17	99.412	3.758	.038	.912
15.5	12	101.000	4.183	.041	1.207	12	101.250	3.981	.039	1.149
16.5	5	98.400	.....	.....	.....	15	99.133	4.924	.050	1.271
17.5	3	109.000	.....	.....	.....	9	98.222	.....	.....	.....
18.5	5	103.400	.....	.....	.....	9	97.666	.....	.....	.....
Adult	19	107.842	6.808	.063	1.561	....	.....	.....	.....	.....

TABLE XXII. AGE CHANGES IN BIGONIAL WIDTH (IN MILLIMETERS), *continued*

HAWAIIAN-ASIATIC-EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	3	89.666	.....	.....	.....	3	87.660	.....	.....	.....
7.5	13	90.846	3.348	.037	.928	16	89.375	3.637	.041	.909
8.5	14	92.786	4.195	.045	1.121	10	88.800	3.010	.034	.952
9.5	11	95.454	3.202	.033	.965	9	92.778	.....	.....	.....
10.5	12	94.167	3.670	.039	1.059	15	92.533	4.395	.047	1.135
11.5	11	98.000	4.729	.048	1.426	12	95.750	5.166	.054	1.491
12.5	11	99.455	2.387	.024	.720	12	98.000	5.067	.052	1.463
13.5	11	97.364	4.417	.045	1.330	10	97.500	5.201	.053	1.645
14.5	11	99.546	5.484	.055	1.653	16	100.813	5.065	.050	1.266
15.5	4	106.750	.....	.....	.....	17	101.647	4.614	.045	1.119
16.5	9	104.444	.....	.....	.....	10	103.300	4.605	.046	1.773
17.5	4	108.000	.....	.....	.....	10	101.100	2.625	.026	.830
18.5	1	99.000	.....	.....	.....	2	99.950	.....	.....	.....
19.5	1	106.000	.....	.....	.....	3	102.667	.....	.....	.....
20.5	1	109.000	.....	.....	.....	1	94.000	.....	.....	.....
Adult	....	.....	.....	.....	.....	4	96.750	.....	.....	.....

TABLE XXIII. AGE CHANGES IN ZYGOMATICO-MANDIBULAR INDEX

HAWAIIAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	9	77.330	.....	.....	.....	6	77.000	.....	.....	.....
7.5	19	76.368	2.322	.030	.532	28	76.535	2.500	.033	.472
8.5	28	77.357	3.538	.046	.668	36	77.389	2.530	.033	.422
9.5	29	77.966	2.773	.036	.514	19	78.158	2.083	.027	.480
10.5	39	77.487	2.757	.036	.441	35	77.286	2.680	.035	.453
11.5	35	77.258	2.322	.030	.392	21	77.571	2.152	.028	.469
12.5	35	77.429	3.074	.040	.519	32	77.813	3.066	.039	.541
13.5	30	76.900	2.879	.037	.531	26	77.346	2.948	.038	.578
14.5	35	77.885	2.926	.038	.494	34	76.618	3.344	.044	.573
15.5	20	76.000	2.214	.029	.495	27	75.814	3.335	.044	.641
16.5	16	78.437	3.674	.047	.918	18	75.944	2.676	.035	.630
17.5	10	76.100	2.508	.033	.793	24	77.000	3.719	.048	.759
18.5	7	77.285	.....	.....	.....	12	75.333	2.015	.027	.582
19.5	5	75.800	.....	.....	.....	9	73.000	.....	.....	.....
Adult	205	77.063	3.754	.049	.262	175	76.485	3.370	.044	.254

CHINESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	5	76.000	.....	.....	.....	9	75.000	.....	.....	.....
6.5	49	76.020	3.490	.046	.499	37	76.216	3.756	.049	.617
7.5	82	76.341	3.094	.040	.342	77	77.013	2.793	.036	.318
8.5	70	76.157	3.055	.040	.365	61	77.869	3.438	.044	.440
9.5	76	76.961	2.903	.038	.333	73	77.233	2.855	.037	.334
10.5	73	77.808	2.679	.034	.313	67	76.925	3.280	.043	.400
11.5	79	77.190	2.687	.035	.302	55	77.018	2.423	.031	.327
12.5	57	77.035	3.418	.044	.453	55	77.145	3.071	.040	.414
13.5	66	77.500	2.681	.035	.330	69	77.058	3.487	.045	.420
14.5	68	77.426	2.917	.038	.354	67	77.000	2.753	.036	.336
15.5	49	77.245	2.853	.037	.408	56	77.589	3.098	.040	.414
16.5	45	77.889	3.150	.040	.469	43	76.791	3.122	.041	.476
17.5	36	77.861	2.573	.033	.429	38	76.132	3.629	.048	.589
18.5	30	79.133	2.540	.032	.464	14	75.071	3.127	.041	.836
19.5	10	78.500	1.565	.020	.495	8	76.500	.....	.....	.....
20.5	8	78.250	.....	.....	.....	1	77.100	.....	.....	.....

TABLE XXIII. AGE CHANGES IN ZYGOMATICO-MANDIBULAR INDEX, *continued*

JAPANESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	74	76.851	2.655	.034	.309	57	75.579	3.628	.048	.480
7.5	105	76.343	3.172	.041	.310	118	77.017	3.223	.042	.297
8.5	108	77.593	2.993	.038	.288	96	77.427	2.972	.038	.303
9.5	99	77.182	3.248	.042	.326	96	77.521	3.119	.040	.318
10.5	101	77.772	2.749	.035	.273	103	77.116	2.857	.037	.281
11.5	82	77.561	2.931	.037	.324	85	77.259	3.061	.040	.332
12.5	106	76.698	3.376	.044	.328	89	77.719	2.898	.037	.307
13.5	102	77.206	2.944	.038	.291	92	76.989	3.357	.044	.350
14.5	124	76.573	3.471	.045	.312	73	76.247	3.209	.042	.376
15.5	107	77.290	3.013	.039	.291	64	76.438	3.703	.048	.463
16.5	89	77.303	3.036	.039	.322	29	77.241	3.510	.045	.652
17.5	60	77.583	3.426	.044	.442	18	77.222	3.225	.042	.760
18.5	38	77.026	3.200	.042	.519	12	76.833	3.531	.046	1.019
19.5	15	78.800	3.709	.047	.958	4	76.700	.....	.....	.....
20.5	15	79.200	3.167	.040	.818	3	74.400	.....	.....	.....
Adult	10	79.500	.....	.....	.....	1	73.500	.....	.....	.....

KOREAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	4	75.925	.....	.....	.....	1	74.100	.....	.....	.....
6.5	4	74.675	.....	.....	.....	4	73.250	.....	.....	.....
7.5	7	74.857	.....	.....	.....	5	75.066	.....	.....	.....
8.5	6	77.413	.....	.....	.....	4	74.525	.....	.....	.....
9.5	8	78.088	.....	.....	.....	9	77.433	.....	.....	.....
10.5	13	77.615	2.588	.033	.718	6	78.316	.....	.....	.....
11.5	13	77.308	2.672	.035	.741	10	77.600	3.169	.041	1.002
12.5	15	78.600	2.939	.037	.759	6	79.480	.....	.....	.....
13.5	14	77.357	2.768	.036	.740	12	79.417	1.892	.024	.546
14.5	18	78.833	2.433	.031	.573	10	78.500	2.335	.030	.738
15.5	9	77.977	.....	.....	.....	22	79.364	2.821	.036	.601
16.5	7	78.186	.....	.....	.....	9	80.183	.....	.....	.....
17.5	6	77.800	.....	.....	.....	4	78.575	.....	.....	.....
18.5	2	79.200	.....	.....	.....	....	.....	.....	.....	.....
19.5	2	78.850	.....	.....	.....	....	.....	.....	.....	.....
20.5	1	75.800	.....	.....	.....	....	.....	.....	.....	.....
Adult	4	77.575	.....	.....	.....	....	.....	.....	.....	.....

NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	78.900	.....	.....	.....	3	79.567	.....	.....	.....
6.5	21	77.238	2.447	.032	.534	18	76.222	2.973	.039	.701
7.5	34	77.265	2.133	.028	.366	29	76.724	2.476	.032	.460
8.5	33	77.212	2.408	.031	.419	38	77.553	2.173	.028	.353
9.5	49	76.796	2.555	.033	.365	31	76.484	1.982	.026	.356
10.5	50	76.960	2.778	.036	.393	28	77.036	2.922	.038	.552
11.5	40	77.350	2.352	.030	.372	21	75.905	2.468	.033	.539
12.5	33	77.364	2.385	.031	.415	40	76.750	3.262	.043	.516
13.5	37	77.946	2.300	.030	.378	41	76.976	2.532	.033	.395
14.5	37	77.784	2.943	.038	.484	49	76.939	2.766	.036	.395
15.5	38	77.842	2.960	.038	.480	42	77.452	3.500	.045	.540
16.5	23	76.957	2.177	.028	.454	35	76.886	3.686	.048	.623
17.5	16	77.375	2.780	.036	.695	26	76.885	2.953	.038	.579
18.5	4	82.750	.....	.....	.....	12	76.167	3.051	.040	.881
19.5	6	78.617	.....	.....	.....	5	76.600	.....	.....	.....
20.5	4	77.925	.....	.....	.....	1	76.600	.....	.....	.....
Adult	3	78.200	.....	.....	.....	12	77.750	2.086	.027	.602

TABLE XXIII. AGE CHANGES IN ZYGOMATICO-MANDIBULAR INDEX, *continued*

SOUTH EUROPEAN

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	....	.....	.....	.....	.....	1	77.190	.....	.....	.....
6.5	30	76.300	2.354	.031	.430	28	76.071	3.625	.048	.685
7.5	52	75.846	3.015	.040	.418	50	76.660	2.596	.034	.367
8.5	37	75.892	2.883	.038	.474	53	75.660	3.491	.046	.480
9.5	43	76.302	2.691	.035	.410	56	76.714	2.992	.039	.400
10.5	47	76.255	3.387	.044	.494	51	76.588	3.082	.040	.432
11.5	54	75.907	3.406	.045	.464	54	76.463	2.402	.031	.327
12.5	55	75.909	3.659	.048	.493	64	75.562	3.409	.045	.426
13.5	44	75.932	3.887	.051	.586	61	75.820	3.409	.045	.436
14.5	35	75.714	3.159	.042	.534	55	75.818	3.767	.050	.508
15.5	19	77.579	3.032	.039	.696	40	74.725	3.899	.052	.616
16.5	12	77.083	1.847	.024	.533	29	75.759	3.730	.049	.693
17.5	7	77.000	.....	.....	.....	25	75.720	3.400	.045	.680
18.5	4	77.950	.....	.....	.....	8	76.220	.....	.....	.....
19.5	2	76.145	.....	.....	.....	8	76.567	.....	.....	.....
20.5	1	77.170	.....	.....	.....	4	71.442	.....	.....	.....
Adult	2	75.950	.....	.....	.....	2	74.060	.....	.....	.....

HAWAIIAN-ASIATIC

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	2	73.500	.....	.....	.....	1	81.400	.....	.....	.....
6.5	23	75.957	2.293	.030	.478	13	76.077	1.489	.020	.413
7.5	34	77.059	3.378	.044	.579	33	76.121	2.227	.029	.388
8.5	36	76.834	2.254	.029	.376	38	77.368	2.254	.029	.366
9.5	32	76.625	2.912	.038	.514	42	76.405	2.664	.035	.411
10.5	39	76.615	2.983	.039	.477	37	76.621	3.388	.044	.557
11.5	25	77.520	2.759	.036	.552	25	77.400	2.545	.033	.509
12.5	24	77.292	3.076	.040	.627	33	76.424	2.720	.036	.474
13.5	24	77.708	2.700	.035	.551	33	76.546	2.764	.036	.481
14.5	27	77.296	2.706	.035	.520	28	76.500	3.344	.044	.632
15.5	17	77.235	2.015	.026	.489	21	76.857	2.748	.036	.600
16.5	8	77.000	.....	.....	.....	30	76.233	3.403	.045	.621
17.5	7	75.400	.....	.....	.....	15	75.667	1.849	.024	.477
18.5	8	77.120	.....	.....	.....	15	74.733	3.941	.053	1.017
19.5	8	75.250	.....	.....	.....	8	74.162	.....	.....	.....
Adult	33	75.545	3.756	.050	.653	30	76.033	3.887	.051	.709

HAWAIIAN-NORTH EUROPEAN

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	80.500	.....	.....	.....	2	75.450	.....	.....	.....
6.5	25	76.960	3.736	.049	.747	20	76.450	3.514	.046	.786
7.5	33	76.394	3.103	.041	.540	36	76.973	2.362	.031	.394
8.5	47	76.660	2.066	.027	.301	38	76.211	2.638	.035	.428
9.5	36	76.778	2.877	.038	.480	47	76.617	2.891	.038	.422
10.5	45	76.667	2.642	.035	.394	47	76.723	2.218	.029	.324
11.5	57	77.193	2.704	.035	.358	54	76.889	2.623	.034	.357
12.5	46	76.783	2.773	.036	.409	35	76.743	2.960	.039	.500
13.5	41	76.341	2.600	.034	.412	57	76.754	2.850	.037	.377
14.5	40	77.300	2.768	.036	.437	50	76.820	2.528	.033	.358
15.5	31	76.742	3.302	.043	.593	53	76.132	2.953	.039	.406
16.5	31	77.419	2.311	.030	.415	38	75.947	2.762	.036	.448
17.5	19	76.734	3.323	.043	.762	37	76.892	3.262	.042	.536
18.5	18	77.556	2.793	.036	.658	25	76.080	3.381	.044	.676
19.5	13	76.385	2.202	.029	.611	13	75.462	3.366	.045	.933
Adult	70	77.400	3.755	.049	.449	79	75.671	2.504	.033	.282

TABLE XXIII. AGE CHANGES IN ZYGOMATICO-MANDIBULAR INDEX, *continued*

HAWAIIAN-SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	73.200	.....	.....	.....	....	.....	.....	.....	.....
6.5	8	78.325	.....	.....	.....	4	77.900	.....	.....	.....
7.5	12	76.250	5.731	.075	1.654	13	77.077	1.208	.016	.334
8.5	19	77.632	3.964	.051	.909	10	78.000	2.720	.035	.860
9.5	21	77.381	3.444	.045	.751	16	76.875	2.261	.029	.565
10.5	16	76.750	2.437	.032	.609	13	77.692	2.839	.036	.787
11.5	21	77.048	2.835	.037	.619	18	78.000	2.404	.031	.057
12.5	12	76.834	3.412	.044	.984	14	76.214	2.858	.037	.763
13.5	18	76.500	2.218	.029	.523	21	76.190	3.581	.047	.781
14.5	7	75.328	.....	.....	.....	17	75.941	2.287	.030	.555
15.5	12	77.417	2.272	.029	.656	12	76.167	1.992	.026	.575
16.5	5	75.400	.....	.....	.....	15	75.933	2.720	.036	.702
17.5	3	78.800	.....	.....	.....	9	74.500	.....	.....	.....
18.5	5	76.480	.....	.....	.....	9	74.222	.....	.....	.....
Adult	19	74.843	4.716	.063	1.081	....	.....	.....	.....	.....

HAWAIIAN-ASIATIC-EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	3	77.967	.....	.....	.....	3	79.200	.....	.....	.....
7.5	13	77.154	2.412	.031	.669	16	77.000	2.476	.032	.619
8.5	14	76.857	1.847	.024	.494	10	75.200	3.842	.051	1.215
9.5	11	77.273	1.814	.023	.547	9	77.367	.....	.....	.....
10.5	12	77.417	2.326	.030	.739	15	76.333	3.771	.049	.974
11.5	11	78.727	2.220	.028	.669	12	76.750	3.654	.048	1.055
12.5	11	77.818	2.037	.026	.614	12	77.500	2.398	.031	.692
13.5	11	76.273	2.490	.033	.751	10	77.200	2.786	.036	.881
14.5	11	76.455	2.965	.039	.894	16	76.813	3.025	.039	.756
15.5	4	80.175	.....	.....	.....	17	77.294	3.593	.046	.871
16.5	9	75.833	.....	.....	.....	10	76.700	4.148	.054	1.312
17.5	4	78.925	.....	.....	.....	10	74.400	2.764	.037	.874
18.5	1	73.300	.....	.....	.....	2	74.000	.....	.....	.....
19.5	1	75.200	.....	.....	.....	3	75.500	.....	.....	.....
20.5	1	81.300	.....	.....	.....	1	68.100	.....	.....	.....
Adult	....	.....	.....	.....	.....	4	72.650	.....	.....	.....

TABLE XXIV. AGE CHANGES IN FACE HEIGHT (IN MILLIMETERS)

HAWAIIAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	9	98.440	.....	.....	.....	6	94.500	.....	.....	.....
7.5	19	100.843	5.640	.056	1.293	28	97.358	5.498	.056	1.038
8.5	28	102.893	5.746	.056	1.085	36	100.862	6.382	.063	1.064
9.5	29	104.690	4.542	.043	.843	19	102.422	4.694	.046	1.076
10.5	39	105.974	5.171	.049	.828	35	104.371	4.660	.045	.787
11.5	35	107.000	4.382	.041	.740	21	108.761	4.608	.042	1.005
12.5	35	110.628	4.629	.042	.782	32	110.218	5.127	.046	.906
13.5	30	110.900	5.459	.049	1.007	27	109.148	5.765	.053	1.109
14.5	35	115.971	7.565	.065	1.278	34	111.088	5.802	.052	.995
15.5	20	118.200	4.895	.041	1.094	27	113.075	6.247	.055	1.202
16.5	16	118.688	5.394	.045	1.348	18	114.556	4.810	.042	1.133
17.5	10	121.800	4.792	.039	1.515	24	114.625	4.820	.042	.983
18.5	7	119.857	.....	.....	.....	12	116.000	5.523	.048	1.594
19.5	5	126.200	.....	.....	.....	9	117.111	.....	.....	.....
Adult	206	125.428	6.692	.053	.466	172	118.046	6.064	.051	.462

TABLE XXIV. AGE CHANGES IN FACE HEIGHT (IN MILLIMETERS), *continued*

CHINESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	5	93.400	.....	.....	.....	9	90.778	.....	.....	.....
6.5	49	95.102	3.860	.040	.551	37	94.540	4.621	.049	.760
7.5	82	95.963	4.600	.048	.508	77	95.208	4.017	.042	.458
8.5	70	99.100	4.485	.045	.536	61	96.475	4.665	.048	.597
9.5	76	100.526	4.622	.046	.530	73	98.151	4.689	.048	.549
10.5	72	101.472	5.307	.052	.625	67	100.179	4.475	.045	.547
11.5	79	102.861	4.740	.046	.533	55	102.000	5.316	.052	.717
12.5	57	106.175	5.404	.051	.716	67	105.209	5.012	.048	.612
13.5	66	108.379	5.540	.051	.682	55	107.164	4.694	.044	.633
14.5	68	111.235	6.589	.059	.799	69	107.333	4.775	.044	.575
15.5	49	115.918	5.948	.051	.850	56	110.839	4.581	.041	.612
16.5	45	114.733	5.851	.051	.872	43	110.930	5.191	.047	.792
17.5	36	117.167	5.225	.044	.871	38	110.579	4.930	.045	.800
18.5	30	119.367	5.443	.045	.994	14	109.286	4.711	.043	1.259
19.5	10	119.400	5.103	.043	1.614	8	111.625	.....	.....	.....
20.5	8	120.750	.....	.....	.....	1	123.000	.....	.....	.....

JAPANESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	74	94.879	4.096	.043	.476	57	94.316	4.946	.052	.655
7.5	105	98.209	4.618	.047	.451	119	96.000	3.739	.039	.343
8.5	108	99.658	4.679	.047	.450	96	97.354	4.357	.045	.444
9.5	99	100.424	4.403	.044	.442	96	99.135	5.149	.052	.525
10.5	101	101.099	4.657	.046	.463	103	101.126	4.251	.042	.419
11.5	82	103.842	5.636	.054	.622	85	103.918	4.933	.047	.535
12.5	106	106.302	4.951	.047	.481	89	104.787	4.772	.046	.506
13.5	102	108.647	5.319	.049	.527	92	108.054	5.023	.046	.524
14.5	124	111.645	5.874	.053	.527	73	109.699	3.909	.036	.458
15.5	107	115.505	4.723	.041	.456	63	109.873	4.456	.041	.561
16.5	89	117.989	5.863	.050	.621	29	113.345	4.543	.040	.844
17.5	60	118.983	5.708	.048	.737	18	111.444	5.123	.046	1.207
18.5	38	121.158	6.266	.052	1.017	13	114.846	5.187	.045	1.438
19.5	15	117.733	5.814	.049	1.501	4	112.250	.....	.....	.....
20.5	15	117.467	3.879	.033	1.001	3	103.667	.....	.....	.....
Adult	10	118.500	.....	.....	.....	1	112.000	.....	.....	.....

KOREAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	4	96.750	.....	.....	.....	1	90.000	.....	.....	.....
6.5	4	95.750	.....	.....	.....	4	97.500	.....	.....	.....
7.5	7	98.429	.....	.....	.....	5	96.000	.....	.....	.....
8.5	6	102.166	.....	.....	.....	4	98.500	.....	.....	.....
9.5	8	101.628	.....	.....	.....	9	99.556	.....	.....	.....
10.5	13	104.615	2.789	.027	.773	6	104.666	.....	.....	.....
11.5	13	105.846	4.572	.043	1.268	10	104.900	5.049	.048	1.597
12.5	15	109.067	4.892	.045	1.263	6	105.167	.....	.....	.....
13.5	14	112.357	5.875	.052	1.570	12	108.250	4.245	.039	1.225
14.5	18	114.056	5.158	.045	1.216	10	110.800	2.400	.022	.759
15.5	9	115.333	.....	.....	.....	22	111.636	5.149	.046	1.098
16.5	7	123.857	.....	.....	.....	9	111.770	.....	.....	.....
17.5	6	119.333	.....	.....	.....	4	114.750	.....	.....	.....
18.5	2	113.000	.....	.....	.....	....	.....	.....	.....	.....
19.5	2	132.500	.....	.....	.....	....	.....	.....	.....	.....
20.5	1	125.000	.....	.....	.....	....	.....	.....	.....	.....
Adult	4	126.500	.....	.....	.....	....	.....	.....	.....	.....

TABLE XXIV. AGE CHANGES IN FACE HEIGHT (IN MILLIMETERS), *continued*

NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	105.000	.....	.....	.....	3	91.333	.....	.....	.....
6.5	21	96.857	4.443	.046	.969	18	95.667	4.497	.047	1.060
7.5	34	98.588	3.474	.035	.596	29	96.655	3.575	.037	.664
8.5	33	100.091	5.071	.051	.883	38	97.500	5.423	.056	.880
9.5	49	101.980	4.089	.040	.584	31	98.387	4.930	.050	.885
10.5	50	102.280	4.626	.045	.654	28	100.929	4.334	.043	.819
11.5	40	105.325	5.711	.054	.903	21	103.952	4.326	.042	.944
12.5	33	106.788	3.906	.037	.680	41	105.683	5.941	.056	.928
13.5	37	108.892	4.798	.044	.789	41	106.341	5.534	.052	.864
14.5	38	111.289	5.785	.052	.939	49	109.224	4.613	.042	.659
15.5	38	115.105	5.646	.049	.916	42	110.405	5.015	.045	.774
16.5	23	118.478	4.577	.039	.954	35	109.829	4.595	.042	.777
17.5	17	118.941	5.341	.045	1.295	26	110.731	4.800	.043	.941
18.5	4	118.250	.....	.....	.....	13	109.846	4.975	.045	1.380
19.5	6	119.500	.....	.....	.....	5	107.200	.....	.....	.....
20.5	4	118.000	.....	.....	.....	1	109.000	.....	.....	.....
Adult	3	120.667	.....	.....	.....	12	112.917	5.823	.052	1.681

SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	....	.....	.....	.....	.....	1	96.000	.....	.....	.....
6.5	30	95.667	4.643	.049	.848	28	93.143	3.711	.040	.701
7.5	52	97.327	4.398	.045	.610	50	95.100	4.776	.050	.675
8.5	35	98.314	4.578	.047	.774	53	97.585	4.823	.049	.663
9.5	43	99.907	4.339	.043	.662	56	98.696	5.271	.053	.704
10.5	47	101.596	5.863	.058	.855	51	100.490	4.317	.043	.605
11.5	54	103.648	5.128	.049	.698	54	100.519	5.191	.052	.706
12.5	55	105.127	5.759	.055	.777	64	104.844	4.681	.045	.585
13.5	44	107.523	5.357	.050	.808	61	107.951	5.582	.052	.715
14.5	35	111.086	5.134	.046	.868	55	108.491	4.710	.043	.635
15.5	19	111.053	5.114	.046	1.173	40	110.300	4.844	.044	.766
16.5	12	114.417	4.368	.038	1.261	29	112.793	5.738	.051	1.066
17.5	7	118.571	.....	.....	.....	25	113.040	4.870	.043	.974
18.5	4	119.400	.....	.....	.....	8	112.250	.....	.....	.....
19.5	2	115.000	.....	.....	.....	8	111.125	.....	.....	.....
20.5	2	130.000	.....	.....	.....	4	114.750	.....	.....	.....
Adult	1	123.000	.....	.....	.....	2	115.500	.....	.....	.....

HAWAIIAN-ASIATIC

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	5	93.500	.....	.....	.....	1	102.000	.....	.....	.....
6.5	23	97.173	4.050	.042	.844	13	95.077	3.518	.037	.976
7.5	34	98.853	4.557	.046	.781	33	96.970	4.764	.049	.829
8.5	36	99.805	5.087	.051	.848	38	100.922	4.170	.041	.679
9.5	32	102.187	5.462	.053	.965	42	101.571	4.106	.040	.634
10.5	39	104.000	4.636	.044	.742	37	102.757	4.252	.041	.698
11.5	25	105.160	5.525	.052	1.105	25	105.200	5.246	.050	1.049
12.5	24	109.000	5.454	.050	1.113	33	107.849	5.554	.052	.967
13.5	24	109.584	7.609	.069	1.553	33	109.636	5.672	.052	.987
14.5	27	113.000	5.298	.047	1.019	28	111.571	4.586	.041	.867
15.5	17	116.000	8.450	.073	2.049	21	114.381	4.064	.036	.887
16.5	8	118.000	.....	.....	.....	30	114.966	4.370	.038	.798
17.5	7	118.200	.....	.....	.....	15	114.066	4.851	.043	1.252
18.5	8	119.100	.....	.....	.....	15	113.934	3.415	.030	.882
19.5	8	121.120	.....	.....	.....	8	112.330	.....	.....	.....
Adult	33	122.516	5.631	.046	.980	30	116.200	5.147	.044	.939

TABLE XXIV. AGE CHANGES IN FACE HEIGHT (IN MILLIMETERS), *continued*

HAWAIIAN-NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	98.000	.....	.....	.....	2	93.500	.....	.....	.....
6.5	25	98.120	3.514	.036	.703	20	97.600	4.443	.046	.994
7.5	33	100.091	4.358	.044	.759	36	96.973	3.723	.038	.621
8.5	47	100.851	4.410	.044	.643	38	98.263	4.429	.045	.719
9.5	36	102.694	4.853	.047	.809	47	100.809	5.445	.054	.794
10.5	45	105.067	4.292	.041	.640	47	104.617	5.941	.057	.867
11.5	57	106.333	5.186	.049	.686	54	106.167	5.145	.048	.700
12.5	47	107.362	4.764	.044	.695	35	107.314	5.231	.049	.884
13.5	41	110.366	5.569	.050	.869	57	109.070	5.597	.051	.741
14.5	40	112.525	6.152	.055	.973	50	110.300	5.120	.046	.724
15.5	31	114.806	5.492	.048	.986	53	112.849	5.784	.051	.794
16.5	31	116.807	5.932	.051	1.065	38	112.474	4.722	.042	.766
17.5	19	120.210	4.187	.035	.961	37	114.541	5.001	.044	.822
18.5	18	119.333	4.655	.039	1.097	25	113.960	4.754	.042	.951
19.5	13	121.231	3.511	.029	.974	13	114.615	4.550	.040	1.262
Adult	70	123.871	6.624	.053	.792	79	116.051	5.026	.043	.565

HAWAIIAN-SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	88.000	.....	.....	.....	....	.....	.....	.....	.....
6.5	8	94.200	.....	.....	.....	4	94.250	.....	.....	.....
7.5	12	97.500	4.252	.044	1.227	13	96.385	4.464	.046	1.237
8.5	19	100.368	4.659	.046	1.069	10	98.700	2.934	.030	.927
9.5	21	100.905	4.219	.042	.921	16	99.875	4.498	.045	1.125
10.5	16	103.750	5.414	.052	1.353	13	100.462	4.971	.050	1.378
11.5	21	109.000	4.761	.044	1.038	18	106.778	4.995	.047	1.177
12.5	12	111.166	4.670	.042	1.348	14	109.000	5.425	.050	1.449
13.5	18	108.778	5.159	.047	1.215	21	109.523	5.142	.047	1.121
14.5	7	113.714	.....	.....	.....	17	113.588	4.159	.037	1.008
15.5	12	115.083	8.568	.074	2.473	12	114.750	5.918	.052	1.708
16.5	5	115.000	.....	.....	.....	15	113.800	4.520	.040	1.167
17.5	3	116.330	.....	.....	.....	9	114.888	.....	.....	.....
18.5	5	117.400	.....	.....	.....	9	115.220	.....	.....	.....
Adult	19	124.736	6.710	.054	1.539	....	.....	.....	.....	.....

HAWAIIAN-ASIATIC-EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	3	93.667	.....	.....	.....	3	94.330	.....	.....	.....
7.5	13	97.615	2.924	.030	.811	16	97.625	4.512	.046	1.128
8.5	14	101.214	4.074	.040	1.089	10	99.100	4.592	.046	1.452
9.5	11	100.546	6.036	.060	1.819	9	99.444	.....	.....	.....
10.5	12	103.667	2.659	.026	.768	15	101.267	3.661	.036	.945
11.5	11	106.364	3.419	.032	1.031	12	107.417	5.951	.055	1.718
12.5	11	108.636	5.677	.052	1.711	12	104.250	4.437	.043	1.281
13.5	11	109.364	5.514	.050	1.662	10	109.700	4.148	.038	1.312
14.5	12	112.583	6.701	.059	1.934	16	109.812	5.548	.050	1.387
15.5	4	119.750	.....	.....	.....	17	115.000	7.187	.062	1.743
16.5	9	118.889	.....	.....	.....	10	114.100	5.890	.052	1.863
17.5	1	115.500	.....	.....	.....	10	112.900	3.961	.035	1.253
18.5	1	127.000	.....	.....	.....	2	113.500	.....	.....	.....
19.5	1	112.000	.....	.....	.....	3	114.000	.....	.....	.....
20.5	1	110.000	.....	.....	.....	1	111.000	.....	.....	.....
Adult	....	.....	.....	.....	.....	4	115.750	.....	.....	.....

TABLE XXV. AGE CHANGES IN ANATOMICAL FACE INDEX

HAWAIIAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	9	83.478	.....	.....	.....	6	81.833	.....	.....	.....
7.5	19	83.527	4.946	.059	1.134	28	83.036	4.610	.056	.871
8.5	28	84.821	4.863	.057	.918	36	83.445	5.340	.064	.890
9.5	29	85.207	3.111	.036	.577	19	84.000	4.154	.049	.952
10.5	39	85.564	4.652	.054	.745	35	84.629	4.679	.055	.790
11.5	35	85.314	3.985	.047	.673	21	86.810	3.685	.042	.804
12.5	35	87.057	4.478	.051	.756	32	86.750	3.092	.036	.546
13.5	30	86.890	4.679	.054	.863	26	86 308	4.479	.052	.878
14.5	35	88.028	4.620	.052	.780	34	85.677	4.503	.052	.772
15.5	20	87.050	4.945	.057	1.106	27	85.889	4.717	.055	.907
16.5	16	86.938	4.841	.056	1.210	18	85.611	3.860	.045	.909
17.5	10	86.600	4.341	.050	1.373	24	85.583	3.415	.040	.697
18.5	7	86.857	.....	.....	.....	12	86.667	5.055	.058	1.459
19.5	5	90.000	.....	.....	.....	9	86.222	.....	.....	.....
Adult	175	86.737	4.689	.054	.354	172	86.174	5.079	.059	.387

CHINESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	5	79.600	.....	.....	.....	9	79.222	.....	.....	.....
6.5	49	80.327	3.830	.048	.547	37	80.135	4.332	.054	.712
7.5	82	80.341	4.006	.050	.442	77	81.286	3.828	.047	.436
8.5	70	82.400	4.307	.052	.515	61	81.623	3.909	.048	.501
9.5	76	82.118	3.960	.048	.454	73	81.356	4.624	.057	.541
10.5	72	82.278	4.638	.056	.547	67	81.925	3.986	.049	.487
11.5	79	83.911	4.128	.049	.464	55	81.964	3.253	.040	.439
12.5	57	83.298	4.449	.053	.589	67	83.358	3.752	.045	.458
13.5	66	83.985	3.863	.046	.475	55	84.145	3.493	.042	.471
14.5	68	84.691	4.535	.053	.550	69	83.319	4.041	.049	.486
15.5	49	86.653	4.235	.049	.605	56	84.143	3.587	.043	.479
16.5	45	84.289	4.199	.050	.626	43	83.698	4.050	.048	.618
17.5	36	85.361	4.849	.057	.808	38	82.763	3.744	.045	.607
18.5	30	85.900	4.556	.053	.832	14	81.429	3.375	.042	.902
19.5	10	84.600	2.577	.030	.815	8	80.500	.....	.....	.....
20.5	8	87.750	.....	.....	.....	1	87.900	.....	.....	.....

JAPANESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	74	79.865	3.520	.044	.409	57	79.509	3.808	.048	.504
7.5	105	80.943	3.987	.049	.389	118	80.652	3.098	.038	.291
8.5	108	81.852	4.079	.050	.392	96	81.656	4.007	.049	.409
9.5	99	81.121	3.780	.046	.380	96	81.854	4.717	.058	.481
10.5	101	81.168	3.426	.042	.341	103	81.991	3.981	.048	.392
11.5	82	83.585	4.627	.055	.511	85	83.059	3.995	.048	.433
12.5	106	83.321	4.134	.050	.402	88	82.750	3.431	.041	.366
13.5	102	83.490	4.082	.049	.404	92	83.130	4.404	.053	.459
14.5	124	83.895	4.353	.052	.391	73	84.384	4.053	.048	.474
15.5	107	85.654	4.225	.049	.408	64	83.516	3.742	.045	.468
16.5	89	85.921	4.626	.054	.490	29	85.138	4.904	.058	.911
17.5	60	85.617	5.060	.059	.653	18	83.667	4.204	.050	.991
18.5	38	86.289	5.050	.058	.819	13	85.769	4.300	.050	1.192
19.5	15	85.400	3.791	.044	.979	4	81.775	.....	.....	.....
20.5	15	85.333	3.156	.037	.815	3	79.167	.....	.....	.....
Adult	10	84.100	.....	.....	.....	1	82.400	.....	.....	.....

TABLE XXV. AGE CHANGES IN ANATOMICAL FACE INDEX, *continued*

KOREAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	4	80.925	.....	.....	.....	1	77.600	.....	.....	.....
6.5	4	76.800	.....	.....	.....	4	78.525	.....	.....	.....
7.5	7	81.000	.....	.....	.....	5	79.500	.....	.....	.....
8.5	6	83.666	.....	.....	.....	4	79.125	.....	.....	.....
9.5	8	79.925	.....	.....	.....	9	81.856	.....	.....	.....
10.5	13	83.077	3.731	.045	1.035	6	82.800	.....	.....	.....
11.5	13	82.692	3.268	.040	.906	10	81.500	5.731	.070	1.812
12.5	15	83.133	3.305	.040	.853	6	80.983	.....	.....	.....
13.5	14	86.000	4.408	.051	1.178	12	81.833	3.363	.041	.971
14.5	18	84.667	3.110	.037	.733	10	81.600	2.653	.033	.839
15.5	9	86.505	.....	.....	.....	22	82.864	3.854	.047	.822
16.5	7	88.543	.....	.....	.....	9	83.166	.....	.....	.....
17.5	6	85.517	.....	.....	.....	4	84.050	.....	.....	.....
18.5	2	81.050	.....	.....	.....	....	.....	.....	.....	.....
19.5	2	93.050	.....	.....	.....	....	.....	.....	.....	.....
20.5	1	94.700	.....	.....	.....	....	.....	.....	.....	.....
Adult	4	85.450	.....	.....	.....	....	.....	.....	.....	.....

NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	88.200	.....	.....	.....	3	81.267	.....	.....	.....
6.5	21	84.286	4.484	.053	.978	18	84.111	3.942	.047	.929
7.5	34	83.412	3.448	.041	.591	29	85.310	4.052	.047	.752
8.5	33	84.727	3.956	.047	.689	38	83.868	4.281	.051	.695
9.5	49	85.327	3.548	.042	.507	31	83.742	4.243	.051	.762
10.5	50	84.840	4.168	.049	.589	28	84.214	4.844	.058	.915
11.5	40	85.475	4.171	.049	.659	21	84.905	3.663	.043	.799
12.5	33	86.303	4.556	.053	.793	40	85.875	4.051	.047	.640
13.5	37	87.243	3.816	.044	.627	41	85.000	4.527	.053	.707
14.5	38	86.895	6.065	.070	.984	49	86.939	4.604	.053	.658
15.5	38	88.211	4.169	.047	.676	42	87.143	5.111	.059	.789
16.5	23	90.174	3.667	.041	.765	35	86.229	4.281	.050	.724
17.5	16	88.563	4.650	.053	1.163	26	86.808	3.813	.044	.748
18.5	4	84.675	.....	.....	.....	11	84.909	2.066	.024	.623
19.5	6	89.350	.....	.....	.....	5	83.600	.....	.....	.....
20.5	4	90.775	.....	.....	.....	1	87.900	.....	.....	.....
Adult	3	87.733	.....	.....	.....	12	84.833	3.648	.043	1.053

SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	....	.....	.....	.....	.....	1	84.210	.....	.....	.....
6.5	30	84.233	4.319	.051	.789	28	83.714	4.342	.052	.820
7.5	52	84.462	4.491	.053	.623	50	85.240	4.207	.049	.595
8.5	37	86.054	5.152	.060	.847	53	85.528	3.715	.043	.510
9.5	43	85.814	4.211	.049	.642	56	85.036	4.272	.050	.571
10.5	47	86.000	5.418	.063	.790	51	85.471	3.538	.041	.495
11.5	54	86.741	4.477	.052	.609	54	85.259	4.213	.049	.573
12.5	55	87.218	4.785	.055	.645	64	87.453	4.347	.050	.543
13.5	44	87.591	4.574	.052	.690	61	87.820	4.393	.050	.562
14.5	35	88.886	3.948	.044	.667	55	86.545	3.442	.040	.464
15.5	19	89.047	3.946	.044	.905	40	87.500	3.879	.044	.613
16.5	12	88.750	3.442	.039	.994	29	89.103	5.731	.064	1.064
17.5	7	89.429	.....	.....	.....	25	88.360	3.587	.041	.717
18.5	4	88.550	.....	.....	.....	8	87.123	.....	.....	.....
19.5	2	87.340	.....	.....	.....	8	86.465	.....	.....	.....
20.5	1	97.690	.....	.....	.....	4	90.725	.....	.....	.....
Adult	2	92.800	.....	.....	.....	2	86.785	.....	.....	.....

TABLE XXV. AGE CHANGES IN ANATOMICAL FACE INDEX, *continued*

HAWAIIAN-ASIATIC

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	2	82.000	.....	.....	.....	1	86.400	.....	.....	.....
6.5	23	82.435	3.835	.046	.799	13	81.231	2.860	.035	.793
7.5	34	82.206	3.708	.045	.635	33	82.364	4.044	.049	.704
8.5	36	82.278	4.128	.050	.688	38	84.105	4.124	.049	.669
9.5	32	83.719	3.375	.040	.596	42	83.904	3.822	.046	.590
10.5	39	84.025	3.418	.041	.547	37	83.946	3.748	.045	.616
11.5	25	84.280	3.789	.045	.758	25	83.120	3.809	.046	.762
12.5	24	85.208	5.187	.061	1.059	33	84.303	4.596	.055	.817
13.5	24	85.208	4.618	.054	.942	33	84.667	4.175	.049	.727
14.5	27	86.482	3.370	.039	.648	28	85.822	2.879	.034	.544
15.5	17	86.648	4.158	.048	1.008	25	85.715	4.505	.053	.983
16.5	8	85.875	.....	.....	.....	30	87.100	4.261	.049	.778
17.5	7	84.900	.....	.....	.....	15	84.666	4.798	.057	1.239
18.5	8	86.220	.....	.....	.....	15	85.267	3.606	.042	.931
19.5	8	85.380	.....	.....	.....	8	83.562	.....	.....	.....
Adult	33	85.424	4.634	.054	.806	30	86.366	4.591	.053	.838

HAWAIIAN-NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	83.000	.....	.....	.....	2	81.900	.....	.....	.....
6.5	25	83.760	2.404	.029	.481	20	84.050	3.867	.046	.865
7.5	33	84.576	3.626	.043	.631	36	83.667	3.455	.041	.576
8.5	47	83.936	3.646	.043	.532	38	83.421	3.718	.045	.603
9.5	36	84.222	4.290	.051	.715	47	85.106	3.646	.043	.532
10.5	45	86.289	3.607	.042	.538	47	85.809	4.770	.056	.696
11.5	57	85.719	4.279	.050	.567	54	86.519	4.202	.049	.572
12.5	46	85.521	4.015	.047	.592	35	85.257	3.713	.044	.628
13.5	41	86.683	3.058	.035	.477	57	85.772	4.313	.050	.571
14.5	40	86.600	4.443	.051	.702	50	85.840	3.976	.046	.562
15.5	31	87.936	4.310	.049	.774	53	86.981	4.580	.053	.629
16.5	31	87.419	4.346	.050	.781	38	86.632	4.874	.056	.791
17.5	19	87.263	3.891	.045	.892	37	86.757	4.102	.047	.674
18.5	18	87.222	3.309	.038	.780	25	86.840	4.351	.050	.870
19.5	13	88.077	3.173	.036	.880	13	86.846	4.093	.047	1.135
Adult	70	86.871	5.185	.060	.620	79	85.810	4.252	.050	.478

HAWAIIAN-SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	81.500	.....	.....	.....	....	.....	.....	.....	.....
6.5	8	83.037	.....	.....	.....	4	85.400	.....	.....	.....
7.5	12	81.666	6.290	.077	1.816	13	83.154	3.008	.036	.834
8.5	19	85.105	4.339	.051	.995	10	84.900	3.833	.045	1.212
9.5	21	83.095	2.759	.033	.602	16	85.062	3.437	.040	.859
10.5	16	85.000	5.185	.061	1.296	13	83.692	4.890	.058	1.356
11.5	21	86.905	5.023	.058	1.096	18	87.945	3.748	.043	.088
12.5	12	89.417	4.769	.053	1.376	14	87.571	3.941	.045	1.053
13.5	18	86.111	4.724	.055	1.113	21	87.858	4.497	.051	.981
14.5	7	86.042	.....	.....	.....	17	86.647	3.677	.042	.892
15.5	12	88.333	5.720	.065	1.651	12	86.500	3.476	.040	1.003
16.5	5	88.220	.....	.....	.....	15	87.067	3.172	.036	.819
17.5	3	84.230	.....	.....	.....	9	87.355	.....	.....	.....
18.5	5	86.880	.....	.....	.....	9	87.600	.....	.....	.....
Adult	19	87.053	4.298	.049	.986	....	.....	.....	.....	.....

TABLE XXV. AGE CHANGES IN ANATOMICAL FACE INDEX, *continued*

HAWAIIAN-ASIATIC-EUROPEAN

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	3	81.567	.....	.....	.....	3	83.266	.....	.....	.....
7.5	13	82.923	3.429	.041	.951	16	84.125	3.982	.047	.996
8.5	14	83.928	3.012	.036	.805	10	84.000	3.256	.039	1.030
9.5	11	81.455	4.418	.054	1.331	9	82.444	.....	.....	.....
10.5	12	85.417	4.348	.051	1.255	15	83.733	3.192	.038	.824
11.5	11	85.545	2.062	.024	.622	12	85.917	3.752	.044	1.083
12.5	11	85.091	4.680	.055	1.411	12	81.333	4.802	.059	1.386
13.5	11	85.091	5.915	.070	1.783	10	86.800	3.628	.042	1.147
14.5	12	87.417	4.573	.052	1.320	16	83.688	4.441	.053	1.110
15.5	4	89.900	.....	.....	.....	17	87.529	4.401	.076	1.067
16.5	9	86.311	.....	.....	.....	10	84.800	5.671	.067	1.793
17.5	4	84.425	.....	.....	.....	10	85.100	2.385	.028	.754
18.5	1	94.100	.....	.....	.....	2	84.600	.....	.....	.....
19.5	1	79.400	.....	.....	.....	3	83.800	.....	.....	.....
20.5	1	82.100	.....	.....	.....	1	80.400	.....	.....	.....
Adult	....	.....	.....	.....	.....	4	82.020	.....	.....	.....

TABLE XXVI. AGE CHANGES IN TRANSVERSE CEPHALO-FACIAL INDEX

HAWAIIAN

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	9	80.220	.....	.....	.....	6	83.500	.....	.....	.....
7.5	19	82.368	1.597	.019	.366	28	83.750	2.458	.029	.464
8.5	28	83.250	2.640	.032	.498	36	84.444	2.742	.032	.457
9.5	29	83.794	2.140	.026	.397	19	85.316	2.903	.034	.665
10.5	39	84.744	2.844	.034	.455	35	86.829	2.709	.031	.457
11.5	35	85.342	2.291	.027	.387	21	86.524	2.737	.032	.597
12.5	35	85.886	2.867	.033	.484	32	87.813	2.468	.028	.436
13.5	30	86.533	2.953	.034	.539	26	88.769	3.214	.036	.630
14.5	35	88.000	2.757	.031	.466	34	88.824	3.158	.036	.541
15.5	20	89.650	2.651	.030	.593	27	88.778	2.249	.025	.432
16.5	16	89.812	2.555	.028	.639	18	89.444	2.191	.024	.516
17.5	10	89.500	1.500	.017	.474	24	89.750	1.808	.020	.369
18.5	7	88.714	.....	.....	.....	12	90.000	2.309	.026	.667
19.5	5	91.600	.....	.....	.....	9	90.111	.....	.....	.....
Adult	206	91.680	3.074	.034	.214	175	89.886	3.010	.033	.228

CHINESE

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	5	81.400	.....	.....	.....	9	82.778	.....	.....	.....
6.5	49	82.633	2.608	.031	.372	37	84.270	2.458	.029	.404
7.5	82	82.695	2.666	.032	.294	77	84.455	3.102	.037	.354
8.5	70	83.743	2.466	.029	.295	61	84.836	2.753	.032	.352
9.5	76	84.592	2.787	.033	.320	73	85.877	2.526	.029	.296
10.5	73	85.685	2.704	.031	.316	67	86.254	2.825	.033	.345
11.5	79	85.797	3.124	.036	.351	55	87.745	3.118	.035	.420
12.5	57	87.298	3.423	.039	.453	67	88.597	3.195	.036	.390
13.5	66	87.924	2.787	.032	.343	55	88.782	3.068	.035	.414
14.5	68	88.868	2.791	.031	.338	69	90.290	3.212	.036	.387
15.5	49	90.204	3.350	.037	.479	56	91.875	2.700	.029	.361
16.5	45	91.444	3.283	.036	.489	43	91.047	2.439	.027	.372
17.5	36	91.639	2.780	.030	.463	38	91.632	3.130	.034	.508
18.5	30	90.933	3.396	.037	.620	14	91.500	2.095	.023	.560
19.5	10	92.500	2.872	.031	.908	8	94.375	.....	.....	.....
20.5	8	92.125	.....	.....	.....	1	92.700	.....	.....	.....

TABLE XXVI. AGE CHANGES IN TRANSVERSE CEPHALO-FACIAL INDEX, *continued*

JAPANESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	74	81.933	2.569	.031	.299	57	83.509	2.811	.034	.372
7.5	105	82.476	2.691	.033	.263	118	83.983	3.005	.036	.277
8.5	108	83.175	2.694	.032	.259	96	84.490	2.858	.034	.292
9.5	99	83.939	2.625	.030	.264	96	85.739	2.759	.032	.281
10.5	101	85.436	2.675	.031	.266	103	86.485	2.508	.029	.247
11.5	82	85.183	2.711	.032	.299	85	87.082	2.313	.026	.251
12.5	106	86.094	3.354	.039	.326	88	88.375	2.748	.031	.293
13.5	102	87.284	3.111	.036	.308	92	89.304	2.553	.029	.266
14.5	124	88.452	3.164	.036	.284	73	89.151	2.447	.027	.286
15.5	107	89.439	2.615	.029	.253	64	90.516	2.862	.032	.358
16.5	89	89.775	3.165	.035	.335	29	89.793	3.387	.038	.629
17.5	60	91.050	3.035	.033	.392	18	90.889	2.025	.022	.477
18.5	38	91.395	2.720	.030	.441	13	90.308	3.688	.041	1.023
19.5	15	89.800	5.009	.056	1.293	4	90.000	.....	.....	.....
20.5	15	91.467	2.474	.027	.639	3	88.907	.....	.....	.....
Adult	10	93.600	.....	.....	.....	1	87.740	.....	.....	.....

KOREAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	4	80.477	.....	.....	.....	1	82.270	.....	.....	.....
6.5	4	82.150	.....	.....	.....	4	89.625	.....	.....	.....
7.5	7	83.553	.....	.....	.....	5	85.350	.....	.....	.....
8.5	6	84.191	.....	.....	.....	4	83.000	.....	.....	.....
9.5	8	86.195	.....	.....	.....	9	86.261	.....	.....	.....
10.5	13	84.385	3.585	.042	.994	6	90.083	.....	.....	.....
11.5	13	86.538	3.320	.038	.921	10	88.500	3.074	.035	.972
12.5	15	87.733	3.066	.035	.792	6	89.358	.....	.....	.....
13.5	14	88.286	2.631	.030	.703	12	89.750	1.533	.017	.443
14.5	18	90.833	2.243	.025	.529	10	92.900	2.022	.022	.639
15.5	9	90.056	.....	.....	.....	22	91.455	3.187	.035	.680
16.5	7	91.926	.....	.....	.....	9	93.088	.....	.....	.....
17.5	6	92.008	.....	.....	.....	4	95.960	.....	.....	.....
18.5	2	97.250	.....	.....	.....	....	.....	.....	.....	.....
19.5	2	91.100	.....	.....	.....	....	.....	.....	.....	.....
20.5	1	93.600	.....	.....	.....	....	.....	.....	.....	.....
Adult	4	92.375	.....	.....	.....	....	.....	.....	.....	.....

NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	82.100	.....	.....	.....	3	81.000	.....	.....	.....
6.5	21	81.238	1.849	.023	.403	18	83.556	1.949	.023	.459
7.5	34	82.941	2.086	.025	.358	29	82.759	2.860	.035	.531
8.5	33	83.273	2.502	.030	.436	38	83.474	2.510	.030	.407
9.5	49	83.653	2.371	.028	.339	31	85.613	2.778	.032	.499
10.5	50	83.420	2.474	.030	.350	28	85.786	2.161	.025	.408
11.5	40	84.750	2.447	.029	.387	21	86.000	2.846	.033	.621
12.5	33	85.242	2.256	.026	.393	40	87.050	1.871	.021	.296
13.5	37	85.919	2.860	.033	.470	41	87.634	2.335	.027	.365
14.5	38	86.316	3.197	.037	.519	49	87.939	2.236	.025	.319
15.5	37	88.000	2.771	.031	.456	41	88.902	2.650	.030	.414
16.5	23	88.696	2.458	.028	.513	35	89.029	2.311	.026	.391
17.5	16	90.250	2.358	.026	.590	26	88.615	3.329	.038	.653
18.5	4	86.550	.....	.....	.....	12	88.667	2.982	.034	.861
19.5	6	88.717	.....	.....	.....	5	86.800	.....	.....	.....
20.5	4	88.250	.....	.....	.....	1	87.900	.....	.....	.....
Adult	3	89.400	.....	.....	.....	12	92.083	3.904	.042	1.127

TABLE XXVI. AGE CHANGES IN TRANSVERSE CEPHALO-FACIAL INDEX, *continued*

SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	....	.....	.....	.....	.....	1	80.280	.....	.....	.....
6.5	30	80.967	2.360	.029	.431	28	82.393	2.651	.032	.501
7.5	52	82.231	2.415	.029	.335	50	83.020	3.095	.037	.438
8.5	37	81.865	2 396	.029	.394	53	83.189	2.809	.034	.386
9.5	43	83.140	3.225	.039	.492	56	84.286	2.298	.027	.307
10.5	47	83.426	2.750	.033	.401	51	84.961	2.588	.030	.362
11.5	54	84.019	2.249	.027	.306	54	85.148	2.490	.029	.339
12.5	55	84.636	2.895	.034	.390	64	86.266	2.557	.030	.320
13.5	44	85.864	3.094	.036	.466	61	87.082	2.550	.029	.327
14.5	35	85.571	2.265	.026	.383	55	88.055	2.883	.033	.389
15.5	19	87.000	2.771	.032	.636	40	89.050	2.025	.023	.320
16.5	12	87.500	1.755	.020	.507	29	87.931	2.816	.032	.523
17.5	7	89.571	.....	.....	.....	25	88.560	2.759	.031	.552
18.5	4	89.700	.....	.....	.....	8	89.240	.....	.....	.....
19.5	2	87.090	.....	.....	.....	8	89.495	.....	.....	.....
20.5	1	85.810	.....	.....	.....	4	88.992	.....	.....	.....
Adult	2	89.850	.....	.....	.....	2	88.700	.....	.....	.....

HAWAIIAN-ASIATIC

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	2	81.500	.....	.....	.....	1	86.100	.....	.....	.....
6.5	23	81.870	2.508	.031	.522	13	83.462	2.204	.026	.611
7.5	34	82.853	2.225	.027	.381	33	83.545	2.175	.026	.379
8.5	35	82.486	2.195	.027	.371	38	84.816	2.280	.027	.370
9.5	32	84.000	2.166	.026	.382	42	85.238	2.090	.025	.322
10.5	39	84.333	1.816	.022	.291	37	86.541	2.506	.029	.412
11.5	25	85.040	2.569	.030	.514	25	86.640	2.651	.031	.530
12.5	24	86.625	3.615	.042	.737	33	87.364	2.973	.034	.518
13.5	24	86.875	3.419	.039	.697	33	88.515	2.862	.032	.498
14.5	27	87.481	2.961	.034	.570	28	88.750	1.903	.021	.360
15.5	17	88.706	2.216	.025	.537	21	89.619	3.981	.044	.869
16.5	8	88.750	.....	.....	.....	30	89.967	2.414	.027	.441
17.5	7	90.900	.....	.....	.....	15	90.133	2.247	.025	.580
18.5	8	90.790	.....	.....	.....	15	89.734	2.955	.033	.763
19.5	8	91.340	.....	.....	.....	8	88.851	.....	.....	.....
Adult	33	91.242	2.598	.028	.452	30	89.534	2.717	.030	.496

HAWAIIAN-NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	85.500	.....	.....	.....	2	79.900	.....	.....	.....
6.5	25	81.960	2.553	.031	.511	20	83.250	2.364	.028	.529
7.5	33	82.879	3.365	.041	.586	36	83.750	2.216	.026	.369
8.5	47	82.788	2.632	.032	.384	38	83.921	2.737	.033	.444
9.5	36	83.722	3.572	.043	.595	47	84.596	2.742	.032	.399
10.5	45	84.533	2.786	.033	.415	47	86.085	2.689	.031	.392
11.5	57	85.246	2.848	.033	.377	54	86.611	2.766	.032	.376
12.5	46	85.413	2.778	.033	.409	35	88.057	2.460	.028	.416
13.5	41	86.781	2.504	.029	.391	57	88.158	2.707	.031	.359
14.5	40	87.675	2.602	.030	.411	50	88.740	2.689	.030	.380
15.5	31	87.516	2.500	.029	.449	53	88.755	2.598	.029	.357
16.5	19	89.632	2.757	.031	.632	38	89.026	2.356	.026	.382
17.5	31	89.904	2.668	.030	.479	37	89.676	2.820	.031	.464
18.5	18	89.222	2.225	.025	.524	25	89.040	2.750	.031	.550
19.5	12	89.333	3.118	.035	.900	13	87.462	1.691	.019	.469
Adult	70	91.471	2.773	.030	.311	79	90.443	3.253	.036	.366

TABLE XXVI. AGE CHANGES IN TRANSVERSE CEPHALO-FACIAL INDEX, *continued*

HAWAIIAN-SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	78.800	.....	.....	.....	....	.....	.....	.....	.....
6.5	8	81.825	.....	.....	.....	4	83.030	.....	.....	.....
7.5	12	83.917	6.525	.078	1.884	13	83.077	1.493	.018	.414
8.5	19	82.368	2.107	.026	.483	10	83.700	2.193	.026	.693
9.5	21	83.524	2.648	.032	.578	16	84.125	2.175	.026	.544
10.5	16	84.375	2.825	.033	.706	13	86.308	2.398	.028	.665
11.5	21	86.095	2.877	.033	.628	18	86.945	2.223	.026	.523
12.5	12	85.250	1.421	.017	.410	14	87.857	2.504	.029	.669
13.5	18	86.778	2.760	.032	.650	21	86.761	2.408	.028	.525
14.5	7	86.442	.....	.....	.....	17	89.765	1.863	.021	.452
15.5	12	87.667	2.427	.028	.701	12	91.167	1.992	.022	.575
16.5	5	88.880	.....	.....	.....	15	90.200	3.059	.034	.790
17.5	3	88.230	.....	.....	.....	8	90.783	.....	.....	.....
18.5	5	91.220	.....	.....	.....	9	89.764	.....	.....	.....
Adult	19	91.473	3.775	.041	.866	....	.....	.....	.....	.....

HAWAIIAN-ASIATIC-EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	3	83.100	.....	.....	.....	3	83.200	.....	.....	.....
7.5	13	82.538	2.098	.025	.582	16	84.063	1.637	.019	.409
8.5	14	82.071	2.086	.025	.557	10	84.800	1.249	.015	.395
9.5	11	84.909	3.579	.042	1.079	9	84.700	.....	.....	.....
10.5	12	84.083	1.847	.022	.533	15	84.933	2.490	.029	.643
11.5	11	85.727	2.093	.024	.631	12	88.917	2.362	.027	.682
12.5	11	86.818	2.623	.030	.791	12	87.917	3.040	.035	.878
13.5	11	85.182	2.249	.026	.678	10	87.600	3.040	.035	.961
14.5	12	84.250	3.394	.040	.980	16	89.125	2.619	.029	.655
15.5	4	87.320	.....	.....	.....	17	89.176	3.468	.039	.841
16.5	9	89.364	.....	.....	.....	10	91.400	2.577	.028	.815
17.5	4	90.725	.....	.....	.....	10	90.400	2.010	.022	.636
18.5	1	88.800	.....	.....	.....	2	86.750	.....	.....	.....
19.5	1	89.200	.....	.....	.....	3	89.863	.....	.....	.....
20.5	1	86.400	.....	.....	.....	1	89.610	.....	.....	.....
Adult	....	.....	.....	.....	.....	4	87.777	.....	.....	.....

TABLE XXVII. AGE CHANGES IN TRANSVERSE FRONTO-PARIETAL INDEX

HAWAIIAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	9	68.000	.....	.....	.....	6	71.666	.....	.....	.....
7.5	19	69.053	2.417	.035	.554	28	70.750	3.248	.046	.613
8.5	28	70.000	3.219	.046	.608	36	70.472	2.672	.038	.445
9.5	29	69.275	3.061	.044	.568	19	71.053	4.383	.062	1.005
10.5	39	70.590	2.676	.038	.429	35	72.086	2.771	.038	.468
11.5	35	70.972	3.038	.043	.513	21	72.143	3.655	.051	.798
12.5	35	70.629	2.839	.040	.480	32	72.375	2.630	.036	.465
13.5	30	70.700	3.068	.043	.560	27	74.482	4.409	.059	.848
14.5	35	72.314	2.339	.032	.395	34	73.147	3.516	.048	.603
15.5	20	73.000	2.898	.040	.648	27	72.630	2.932	.040	.564
16.5	16	70.813	2.731	.038	.683	18	72.222	3.568	.049	.840
17.5	10	70.100	3.360	.048	1.063	24	72.709	2.936	.040	.599
18.5	7	71.428	.....	.....	.....	12	73.333	2.135	.029	.616
19.5	5	70.600	.....	.....	.....	9	70.888	.....	.....	.....
Adult	206	68.441	3.082	.045	.214	175	69.594	3.206	.046	.242

TABLE XXVII. AGE CHANGES IN TRANSVERSE FRONTO-PARIETAL INDEX, *continued*

CHINESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	5	66.000	.....	.....	.....	9	66.667	.....	.....	.....
6.5	49	68.224	3.576	.052	.511	37	68.162	3.701	.054	.608
7.5	82	68.159	2.965	.043	.327	77	70.000	3.248	.046	.370
8.5	70	69.028	2.812	.041	.336	61	70.180	3.226	.046	.413
9.5	76	69.961	2.478	.035	.284	73	71.466	3.416	.048	.400
10.5	73	70.836	3.025	.043	.354	67	71.881	2.594	.036	.317
11.5	79	70.278	2.823	.040	.318	55	72.309	3.384	.047	.456
12.5	57	71.631	3.607	.050	.478	67	72.403	2.998	.041	.366
13.5	66	72.258	3.611	.050	.444	55	73.491	3.603	.049	.486
14.5	68	72.515	2.811	.039	.341	69	74.261	2.619	.035	.315
15.5	49	73.306	2.992	.041	.427	56	74.286	3.121	.042	.417
16.5	45	73.467	3.474	.047	.518	43	74.907	2.198	.029	.335
17.5	36	74.111	3.239	.044	.540	38	74.368	2.766	.037	.449
18.5	30	73.600	3.093	.042	.565	14	72.786	1.780	.024	.476
19.5	10	72.700	1.005	.014	.318	8	77.250	.....	.....	.....
20.5	8	73.750	.....	.....	.....	1	77.500	.....	.....	.....

JAPANESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	74	66.527	3.557	.053	.413	57	67.544	4.425	.066	.586
7.5	105	67.572	2.865	.042	.279	118	69.186	3.840	.055	.353
8.5	108	68.898	2.966	.043	.285	96	70.062	2.849	.041	.291
9.5	99	69.202	2.700	.039	.271	96	71.021	3.135	.044	.320
10.5	101	69.109	2.786	.040	.277	103	71.612	3.092	.043	.305
11.5	82	69.988	2.778	.040	.307	85	71.741	2.995	.042	.325
12.5	106	70.594	3.102	.044	.301	89	72.787	2.961	.041	.314
13.5	102	71.255	3.018	.042	.299	92	73.402	2.924	.040	.304
14.5	124	72.411	3.074	.042	.276	73	73.411	2.369	.032	.277
15.5	107	73.065	2.809	.038	.272	64	74.047	2.924	.039	.366
16.5	89	72.416	2.963	.041	.314	29	74.172	2.805	.038	.521
17.5	60	73.167	2.793	.038	.360	18	74.167	2.795	.038	.659
18.5	38	72.289	3.524	.049	.572	13	73.000	3.064	.042	.850
19.5	15	73.133	2.777	.038	.717	4	72.325	.....	.....	.....
20.5	15	72.933	4.328	.059	1.117	3	74.217	.....	.....	.....
Adult	10	72.600	.....	.....	.....	1	74.840	.....	.....	.....

KOREAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	4	65.657	.....	.....	.....	1	64.540	.....	.....	.....
6.5	4	66.457	.....	.....	.....	4	72.000	.....	.....	.....
7.5	7	68.581	.....	.....	.....	5	68.682	.....	.....	.....
8.5	6	70.241	.....	.....	.....	4	73.132	.....	.....	.....
9.5	8	71.119	.....	.....	.....	9	72.500	.....	.....	.....
10.5	13	70.231	2.805	.040	.778	6	73.933	.....	.....	.....
11.5	13	70.462	3.202	.045	.888	10	72.700	3.164	.044	1.001
12.5	15	71.533	3.222	.045	.832	6	74.608	.....	.....	.....
13.5	14	72.429	2.412	.033	.645	12	74.917	2.929	.039	.846
14.5	18	75.056	2.226	.030	.525	10	78.000	2.720	.035	.860
15.5	9	73.195	.....	.....	.....	22	75.000	4.211	.056	.898
16.5	7	74.414	.....	.....	.....	9	76.440	.....	.....	.....
17.5	6	75.925	.....	.....	.....	4	76.800	.....	.....	.....
18.5	2	75.950	.....	.....	.....	....	.....	.....	.....	.....
19.5	2	73.250	.....	.....	.....	....	.....	.....	.....	.....
20.5	1	83.700	.....	.....	.....	....	.....	.....	.....	.....
Adult	4	69.975	.....	.....	.....	....	.....	.....	.....	.....

TABLE XXVII. AGE CHANGES IN TRANSVERSE FRONTO-PARIETAL INDEX, *continued*

NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	73.800	.....	.....	.....	3	70.667	.....	.....	.....
6.5	21	70.333	2.551	.036	.557	18	72.611	2.313	.032	.545
7.5	34	72.529	3.051	.042	.523	29	72.655	3.187	.044	.592
8.5	32	72.562	3.030	.042	.536	38	72.368	2.433	.034	.395
9.5	49	71.980	2.759	.038	.394	31	74.194	3.126	.042	.561
10.5	50	72.660	2.775	.038	.392	28	73.643	2.742	.037	.518
11.5	40	72.750	3.338	.046	.528	21	73.333	2.834	.039	.618
12.5	33	73.364	3.480	.047	.606	41	74.488	2.812	.038	.439
13.5	37	73.270	3.226	.044	.530	41	75.146	2.665	.035	.416
14.5	38	73.579	2.853	.039	.463	49	75.388	2.632	.035	.376
15.5	37	74.108	2.502	.034	.411	40	76.400	3.072	.040	.486
16.5	23	74.826	3.059	.041	.638	35	76.657	2.946	.038	.498
17.5	17	74.882	2.846	.038	.690	26	75.269	3.727	.050	.731
18.5	4	74.075	.....	.....	.....	13	77.462	3.320	.043	.921
19.5	6	74.000	.....	.....	.....	5	76.800	.....	.....	.....
20.5	4	75.533	.....	.....	.....	1	73.800	.....	.....	.....
Adult	3	71.200	.....	.....	.....	12	73.750	3.514	.048	1.014

SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	....	.....	.....	.....	.....	1	68.310	.....	.....	.....
6.5	30	69.033	2.470	.036	.451	28	70.321	3.036	.043	.574
7.5	52	69.731	2.379	.034	.330	50	70.920	3.351	.047	.474
8.5	37	69.865	2.207	.032	.363	53	71.283	2.390	.034	.328
9.5	43	70.837	2.650	.037	.404	56	71.571	2.604	.036	.348
10.5	47	70.872	2.110	.030	.308	51	72.353	1.970	.027	.276
11.5	54	71.778	2.929	.041	.399	54	72.648	2.349	.032	.320
12.5	55	71.836	2.762	.038	.372	64	73.203	2.694	.037	.337
13.5	44	72.409	3.033	.042	.457	61	73.721	2.600	.035	.333
14.5	35	73.314	3.413	.047	.577	55	73.055	3.148	.043	.424
15.5	19	73.158	3.468	.047	.796	40	74.200	2.170	.029	.343
16.5	12	74.333	2.867	.039	.828	29	73.310	2.575	.035	.478
17.5	7	73.000	.....	.....	.....	25	73.120	2.890	.040	.578
18.5	4	75.600	.....	.....	.....	8	73.628	.....	.....	.....
19.5	2	72.255	.....	.....	.....	8	73.718	.....	.....	.....
20.5	1	72.970	.....	.....	.....	4	74.592	.....	.....	.....
Adult	2	70.900	.....	.....	.....	2	70.700	.....	.....	.....

HAWAIIAN-ASIATIC

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	2	69.500	.....	.....	.....	1	72.300	.....	.....	.....
6.5	23	68.565	3.658	.053	.763	13	69.538	4.272	.061	1.185
7.5	34	69.353	3.225	.046	.553	33	70.121	2.463	.035	.429
8.5	35	69.371	2.414	.035	.408	38	70.605	2.569	.036	.417
9.5	32	70.000	2.739	.039	.484	42	70.786	3.004	.042	.464
10.5	39	70.103	2.844	.040	.455	37	72.162	2.377	.033	.391
11.5	25	72.040	2.750	.038	.550	25	71.600	2.939	.041	.588
12.5	24	71.625	3.473	.048	.709	33	72.727	3.077	.042	.536
13.5	24	71.583	3.463	.048	.707	33	73.030	3.030	.041	.527
14.5	27	71.778	3.644	.051	.701	28	73.607	2.704	.037	.511
15.5	17	72.235	2.902	.040	.704	21	73.000	2.707	.037	.591
16.5	8	73.000	.....	.....	.....	30	72.800	2.040	.028	.372
17.5	7	69.500	.....	.....	.....	15	72.800	2.948	.040	.761
18.5	8	74.200	.....	.....	.....	15	72.667	2.982	.041	.770
19.5	8	72.730	.....	.....	.....	8	71.251	.....	.....	.....
Adult	33	69.546	3.977	.057	.692	30	70.200	3.291	.047	.600

TABLE XXVII. AGE CHANGES IN TRANSVERSE FRONTO-PARIETAL INDEX, *continued*

HAWAIIAN-NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	71.700	.....	.....	.....	2	70.000	.....	.....	.....
6.5	25	69.880	3.166	.045	.623	20	71.350	3.022	.042	.676
7.5	33	70.788	3.311	.047	.576	36	71.917	2.670	.037	.445
8.5	47	70.127	2.573	.037	.375	38	71.684	2.983	.042	.484
9.5	36	70.194	3.195	.046	.533	47	72.404	3.092	.043	.451
10.5	45	71.311	2.563	.036	.382	47	73.191	2.757	.038	.402
11.5	57	71.649	2.640	.037	.350	54	73.685	2.672	.036	.364
12.5	46	71.565	2.811	.039	.414	35	74.914	2.676	.036	.452
13.5	41	72.537	2.421	.033	.378	57	73.561	3.260	.044	.432
14.5	40	73.025	3.134	.043	.495	50	74.540	3.151	.042	.446
15.5	31	72.839	3.050	.042	.548	53	73.868	2.755	.037	.378
16.5	31	73.710	3.294	.045	.592	38	74.395	2.805	.038	.455
17.5	19	73.474	2.347	.032	.538	37	73.514	3.151	.043	.518
18.5	18	73.278	2.156	.029	.508	25	74.800	2.953	.039	.591
19.5	12	74.333	3.172	.043	.916	13	72.154	2.958	.041	.820
Adult	70	70.129	3.541	.050	.423	79	71.646	3.413	.048	.384

HAWAIIAN-SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	72.900	.....	.....	.....	....	.....	.....	.....	.....
6.5	8	69.925	.....	.....	.....	4	69.975	.....	.....	.....
7.5	12	70.333	3.092	.044	.893	13	71.846	1.792	.025	.497
8.5	19	69.789	2.746	.039	.630	10	72.900	2.508	.034	.793
9.5	21	70.762	3.191	.045	.696	16	71.875	3.038	.042	.760
10.5	16	72.250	3.666	.051	.916	13	72.615	3.341	.046	.926
11.5	21	72.333	2.731	.038	.596	18	73.055	2.147	.029	.506
12.5	12	71.833	2.640	.037	.762	14	74.929	2.283	.030	.610
13.5	18	71.889	3.479	.048	.820	21	73.524	2.322	.032	.507
14.5	7	72.057	.....	.....	.....	17	74.882	2.676	.036	.649
15.5	12	72.333	3.064	.042	.884	12	76.000	2.198	.029	.635
16.5	5	72.376	.....	.....	.....	15	74.933	3.435	.046	.887
17.5	3	68.260	.....	.....	.....	8	72.556	.....	.....	.....
18.5	5	74.766	.....	.....	.....	9	73.131	.....	.....	.....
Adult	19	70.527	3.266	.046	.749	....	.....	.....	.....	.....

HAWAIIAN-ASIATIC-EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	3	69.367	.....	.....	.....	3	75.800	.....	.....	.....
7.5	13	70.000	3.259	.047	.904	16	71.438	2.317	.032	.579
8.5	14	69.786	2.366	.034	.632	10	71.800	2.600	.036	.822
9.5	11	71.000	3.219	.045	.970	9	70.522	.....	.....	.....
10.5	12	70.333	1.597	.023	.461	15	72.133	3.138	.044	.810
11.5	11	71.727	2.220	.031	.669	12	74.083	2.661	.036	.768
12.5	11	71.364	2.869	.040	.865	12	73.250	2.711	.037	.783
13.5	11	71.000	2.412	.034	.727	10	73.700	3.378	.046	1.068
14.5	12	72.417	2.431	.034	.702	16	72.812	2.506	.034	.627
15.5	4	71.665	.....	.....	.....	17	73.706	3.082	.042	.748
16.5	9	73.333	.....	.....	.....	10	74.100	2.166	.029	.685
17.5	4	72.000	.....	.....	.....	10	73.700	3.437	.047	1.087
18.5	1	72.400	.....	.....	.....	2	69.650	.....	.....	.....
19.5	1	69.600	.....	.....	.....	3	72.593	.....	.....	.....
20.5	1	75.500	.....	.....	.....	1	71.430	.....	.....	.....
Adult	....	.....	.....	.....	.....	4	69.150	.....	.....	.....

TABLE XXVIII. AGE CHANGES IN NOSE HEIGHT (IN MILLIMETERS)

HAWAIIAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	9	41.770	.....	.....	.....	6	41.166	.....	.....	.....
7.5	19	43.368	2.941	.068	.674	28	42.142	3.572	.085	.674
8.5	28	44.785	4.370	.098	.825	36	43.972	2.456	.056	.409
9.5	29	45.656	2.844	.062	.528	19	44.895	3.740	.083	.857
10.5	39	46.256	3.077	.066	.492	35	45.457	3.110	.068	.525
11.5	35	46.257	3.298	.071	.557	21	47.333	3.428	.072	.748
12.5	35	48.057	2.243	.047	.379	32	47.906	3.156	.066	.557
13.5	30	48.400	4.184	.086	.772	27	48.037	3.350	.070	.644
14.5	35	49.715	3.731	.075	.630	34	47.736	3.231	.068	.554
15.5	20	51.850	3.276	.063	.733	27	49.334	3.209	.065	.617
16.5	16	51.813	3.728	.072	.932	18	50.389	2.691	.053	.634
17.5	10	53.400	2.538	.048	.803	24	50.000	2.613	.052	.533
18.5	7	53.000	.....	.....	.....	12	51.333	2.173	.042	.627
19.5	5	53.000	.....	.....	.....	9	50.444	.....	.....	.....
Adult	205	55.600	3.872	.070	.270	175	52.080	3.928	.075	.296

CHINESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	5	38.000	.....	.....	.....	9	37.889	.....	.....	.....
6.5	49	39.592	2.482	.063	.355	37	39.757	3.404	.086	.560
7.5	82	40.768	2.729	.067	.301	77	40.740	2.789	.068	.318
8.5	70	42.500	2.655	.062	.317	60	41.883	2.973	.071	.384
9.5	76	43.381	3.090	.071	.354	73	42.507	2.805	.066	.328
10.5	73	43.617	2.978	.068	.348	67	43.493	3.058	.070	.374
11.5	79	43.962	2.771	.063	.312	55	44.327	2.744	.062	.370
12.5	57	44.930	3.240	.072	.429	67	45.478	2.924	.064	.357
13.5	66	46.318	3.762	.081	.463	55	46.909	2.518	.054	.340
14.5	68	47.618	3.877	.081	.470	69	46.406	2.789	.060	.336
15.5	49	49.674	2.766	.056	.395	56	47.286	2.506	.053	.335
16.5	45	49.178	3.260	.066	.486	43	47.930	3.187	.066	.486
17.5	36	49.750	3.361	.067	.560	38	46.421	2.711	.058	.440
18.5	30	51.767	2.895	.056	.528	14	47.000	4.000	.085	1.069
19.5	10	51.100	3.872	.076	1.224	8	50.000	.....	.....	.....
20.5	8	52.375	.....	.....	.....	1	55.000	.....	.....	.....

JAPANESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	74	39.568	2.795	.071	.325	57	38.684	3.853	.099	.510
7.5	105	41.524	3.208	.077	.313	119	40.597	3.026	.074	.277
8.5	108	42.277	3.030	.072	.291	96	41.635	2.705	.065	.276
9.5	99	42.525	2.691	.063	.270	96	42.333	3.360	.079	.343
10.5	101	43.248	3.023	.070	.301	103	43.728	2.943	.067	.290
11.5	82	44.512	3.354	.075	.370	85	44.647	3.311	.074	.359
12.5	106	45.057	3.282	.073	.319	89	45.079	3.512	.078	.372
13.5	102	46.323	3.063	.066	.303	92	45.859	3.105	.068	.324
14.5	124	46.532	4.051	.087	.364	73	46.151	3.423	.074	.401
15.5	107	48.626	3.587	.074	.347	64	46.813	2.926	.063	.366
16.5	89	49.652	3.717	.075	.394	29	48.139	2.921	.061	.542
17.5	60	50.700	2.888	.057	.373	18	47.056	3.674	.078	.866
18.5	38	50.868	2.895	.057	.470	13	48.615	3.102	.064	.860
19.5	15	50.267	2.462	.049	.636	4	49.750	.....	.....	.....
20.5	15	49.733	3.855	.077	.995	3	43.667	.....	.....	.....
Adult	10	50.400	.....	.....	.....	1	45.000	.....	.....	.....

TABLE XXVIII. AGE CHANGES IN NOSE HEIGHT (IN MILLIMETERS), *continued*

KOREAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	4	39.500	.....	.....	.....	1	32.000	.....	.....	.....
6.5	4	40.750	.....	.....	.....	4	40.750	.....	.....	.....
7.5	7	43.429	.....	.....	.....	5	41.600	.....	.....	.....
8.5	6	45.166	.....	.....	.....	4	41.250	.....	.....	.....
9.5	8	43.128	.....	.....	.....	9	42.333	.....	.....	.....
10.5	13	46.000	2.385	.052	.661	6	44.833	.....	.....	.....
11.5	13	46.231	3.511	.076	.974	10	46.900	2.022	.043	.639
12.5	15	47.467	3.118	.066	.805	6	46.500	.....	.....	.....
13.5	14	49.071	3.262	.066	.872	12	47.500	3.041	.064	.878
14.5	18	50.278	3.176	.063	.749	10	47.500	1.910	.040	.604
15.5	9	51.000	.....	.....	.....	22	48.773	2.827	.058	.603
16.5	7	53.143	.....	.....	.....	9	47.880	.....	.....	.....
17.5	6	51.167	.....	.....	.....	4	51.500	.....	.....	.....
18.5	2	49.500	.....	.....	.....	....	.....	.....	.....	.....
19.5	2	56.500	.....	.....	.....	....	.....	.....	.....	.....
20.5	1	56.000	.....	.....	.....	....	.....	.....	.....	.....
Adult	4	57.500	.....	.....	.....	....	.....	.....	.....	.....

NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	50.000	.....	.....	.....	3	37.333	.....	.....	.....
6.5	21	40.048	1.987	.050	.434	18	39.667	2.494	.063	.588
7.5	34	41.500	1.990	.048	.341	29	40.241	2.358	.059	.438
8.5	33	41.485	2.775	.067	.483	38	41.447	2.468	.060	.400
9.5	48	42.542	2.550	.060	.368	31	42.226	2.960	.070	.532
10.5	50	42.700	2.809	.066	.397	28	43.464	2.598	.060	.491
11.5	40	43.600	3.097	.071	.490	20	43.900	2.234	.051	.500
12.5	33	45.242	3.551	.078	.618	41	45.049	3.547	.079	.554
13.5	37	46.514	2.983	.064	.490	41	45.902	3.237	.071	.506
14.5	38	47.474	3.611	.076	.586	48	47.417	2.404	.051	.347
15.5	38	49.737	2.468	.050	.400	42	47.857	2.900	.061	.447
16.5	22	50.545	2.369	.047	.505	34	48.324	2.551	.053	.437
17.5	17	50.529	2.615	.052	.634	26	48.654	3.222	.066	.632
18.5	4	52.250	.....	.....	.....	13	48.231	2.832	.059	.785
19.5	6	50.833	.....	.....	.....	5	46.800	.....	.....	.....
20.5	4	51.750	.....	.....	.....	1	50.000	.....	.....	.....
Adult	3	53.333	.....	.....	.....	12	49.917	2.532	.051	.731

SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	....	.....	.....	.....	.....	1	44.000	.....	.....	.....
6.5	30	39.533	2.291	.058	.418	28	38.250	3.738	.098	.706
7.5	52	40.327	3.344	.083	.464	50	40.000	2.857	.071	.404
8.5	37	40.892	3.030	.074	.498	53	40.698	2.709	.067	.372
9.5	43	42.512	2.565	.060	.391	56	41.625	3.233	.078	.432
10.5	47	43.213	3.421	.079	.499	51	42.569	3.500	.082	.490
11.5	54	44.093	3.002	.068	.409	54	44.222	2.879	.065	.392
12.5	55	44.891	3.335	.074	.450	64	45.859	3.137	.068	.392
13.5	43	44.628	3.285	.074	.500	61	47.180	2.802	.059	.359
14.5	35	47.143	3.758	.080	.635	55	47.273	2.693	.057	.363
15.5	19	47.895	3.507	.073	.805	40	48.275	3.217	.067	.509
16.5	12	49.250	2.832	.058	.818	29	48.069	3.850	.080	.715
17.5	7	51.000	.....	.....	.....	25	49.040	2.646	.054	.529
18.5	4	49.500	.....	.....	.....	8	49.500	.....	.....	.....
19.5	2	48.500	.....	.....	.....	8	48.875	.....	.....	.....
20.5	1	53.000	.....	.....	.....	4	52.000	.....	.....	.....
Adult	2	52.500	.....	.....	.....	2	52.000	.....	.....	.....

TABLE XXVIII. AGE CHANGES IN NOSE HEIGHT (IN MILLIMETERS), *continued*

HAWAIIAN-ASIATIC

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	2	40.500	.....	.....	.....	1	46.000	.....	.....	.....
6.5	23	41.521	3.119	.075	.650	13	40.615	2.387	.059	.662
7.5	34	41.941	2.668	.064	.457	33	41.848	3.457	.083	.602
8.5	36	42.778	3.466	.081	.577	38	43.421	3.468	.080	.563
9.5	32	44.375	4.151	.094	.733	42	43.810	2.736	.062	.422
10.5	39	44.538	3.194	.072	.511	37	44.513	3.454	.078	.568
11.5	26	45.962	3.379	.074	.662	25	45.360	2.841	.063	.568
12.5	24	47.333	2.793	.059	.570	33	45.848	3.509	.077	.611
13.5	24	48.209	3.135	.065	.639	33	47.515	4.135	.087	.720
14.5	27	49.334	2.567	.052	.494	28	49.000	2.330	.048	.440
15.5	17	51.059	3.918	.077	.950	21	48.333	2.816	.058	.615
16.5	8	50.100	.....	.....	.....	30	49.374	2.337	.047	.427
17.5	7	51.300	.....	.....	.....	15	50.000	2.707	.054	.699
18.5	8	50.500	.....	.....	.....	15	50.133	3.384	.068	.874
19.5	8	50.875	.....	.....	.....	8	51.500	.....	.....	.....
Adult	33	54.181	3.167	.058	.551	30	50.866	2.895	.057	.528

HAWAIIAN-NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	41.000	.....	.....	.....	2	43.000	.....	.....	.....
6.5	25	40.920	2.447	.060	.489	20	41.900	2.844	.068	.636
7.5	33	42.697	3.069	.072	.534	36	41.750	2.510	.060	.418
8.5	47	42.596	2.655	.062	.387	38	43.579	2.571	.059	.417
9.5	36	43.667	2.926	.067	.488	46	43.391	3.145	.072	.464
10.5	45	44.422	3.110	.070	.464	47	45.064	3.076	.068	.449
11.5	57	45.596	3.217	.071	.426	54	46.130	3.250	.070	.442
12.5	47	46.425	3.363	.072	.491	34	46.529	3.388	.073	.581
13.5	41	47.439	3.387	.071	.529	57	47.491	2.791	.059	.370
14.5	40	49.050	3.435	.070	.543	50	47.640	3.025	.063	.428
15.5	31	49.065	3.202	.065	.575	53	48.962	3.046	.062	.418
16.5	31	50.936	3.707	.073	.665	38	48.895	3.110	.064	.505
17.5	19	51.737	1.995	.039	.458	37	50.514	2.687	.053	.442
18.5	18	51.167	3.041	.059	.716	25	50.320	3.095	.062	.619
19.5	13	51.461	1.905	.037	.528	13	51.615	2.557	.050	.709
Adult	69	54.304	4.158	.077	.501	79	51.633	3.154	.061	.355

HAWAIIAN-SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	33.000	.....	.....	.....	....	.....	.....	.....	.....
6.5	8	38.750	.....	.....	.....	4	39.750	.....	.....	.....
7.5	12	41.333	2.625	.064	.758	13	40.846	2.796	.068	.775
8.5	19	43.632	2.229	.051	.511	10	42.200	1.720	.041	.543
9.5	21	42.381	2.360	.056	.515	16	43.125	2.977	.069	.744
10.5	16	44.062	3.326	.076	.832	13	44.308	3.538	.080	.981
11.5	21	46.381	3.046	.066	.665	18	46.055	2.066	.045	.486
12.5	12	47.916	4.744	.099	1.369	14	47.929	3.536	.074	.944
13.5	18	46.945	3.357	.072	.791	21	47.809	2.970	.062	.648
14.5	7	50.571	.....	.....	.....	17	48.706	3.063	.063	.742
15.5	12	49.083	4.443	.091	1.282	12	49.917	3.068	.061	.886
16.5	5	49.600	.....	.....	.....	15	49.600	2.728	.055	.704
17.5	3	50.330	.....	.....	.....	9	50.111	.....	.....	.....
18.5	5	52.400	.....	.....	.....	9	49.440	.....	.....	.....
Adult	19	54.843	4.343	.079	.996	....	.....	.....	.....	.....

TABLE XXVIII. AGE CHANGES IN NOSE HEIGHT (IN MILLIMETERS), *continued*

HAWAIIAN-ASIATIC-EUROPEAN

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	3	39.667	.....	.....	.....	3	40.660	.....	.....	.....
7.5	13	41.000	2.717	.066	.753	16	41.813	2.604	.062	.651
8.5	14	43.143	2.385	.055	.637	10	42.100	1.814	.043	.574
9.5	11	42.364	3.023	.071	.911	9	43.222	.....	.....	.....
10.5	12	44.917	1.113	.025	.321	15	44.933	3.087	.069	.797
11.5	11	44.818	2.657	.059	.801	12	44.500	3.122	.070	.901
12.5	11	46.182	3.834	.083	1.156	12	45.500	2.724	.060	.786
13.5	11	46.818	2.823	.060	.851	10	47.100	2.385	.050	.754
14.5	12	48.750	4.511	.092	1.302	16	47.875	2.759	.058	.690
15.5	4	52.750	.....	.....	.....	17	49.529	3.759	.076	.912
16.5	9	51.555	.....	.....	.....	10	48.400	3.498	.072	1.106
17.5	4	49.750	.....	.....	.....	10	50.300	2.369	.047	.749
18.5	1	52.000	.....	.....	.....	2	47.000	.....	.....	.....
19.5	1	48.000	.....	.....	.....	3	49.000	.....	.....	.....
20.5	1	41.000	.....	.....	.....	1	48.000	.....	.....	.....
Adult	....	.....	.....	.....	.....	4	51.750	.....	.....	.....

TABLE XXIX. AGE CHANGES IN NOSE WIDTH (IN MILLIMETERS)

HAWAIIAN

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	9	34.000	.....	.....	.....	6	33.333	.....	.....	.....
7.5	19	33.053	2.114	.064	.484	28	32.785	1.897	.058	.358
8.5	29	34.138	2.064	.060	.383	36	33.028	1.892	.057	.315
9.5	28	33.822	2.172	.064	.410	19	34.000	2.596	.076	.595
10.5	39	34.667	2.267	.065	.363	35	34.429	2.534	.074	.428
11.5	35	35.285	2.133	.060	.360	21	35.476	2.107	.059	.459
12.5	35	35.800	2.876	.080	.486	32	36.468	3.455	.095	.610
13.5	30	36.567	2.753	.075	.508	27	36.815	2.694	.073	.518
14.5	35	38.515	3.400	.088	.574	34	37.824	1.977	.052	.339
15.5	20	39.000	2.683	.069	.599	27	37.926	1.584	.042	.304
16.5	16	39.375	1.995	.051	.498	18	37.667	2.260	.060	.532
17.5	10	41.600	2.417	.058	.764	24	39.542	2.482	.063	.506
18.5	7	39.571	.....	.....	.....	12	38.417	3.353	.087	.968
19.5	5	40.400	.....	.....	.....	9	40.888	.....	.....	.....
Adult	206	43.530	3.022	.069	.210	175	40.422	2.726	.067	.206

CHINESE

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	5	29.800	.....	.....	.....	9	29.555	.....	.....	.....
6.5	49	31.265	1.903	.060	.272	37	30.162	1.685	.056	.277
7.5	82	31.707	2.177	.069	.240	77	30.675	1.670	.054	.190
8.5	70	32.000	1.844	.058	.220	61	31.344	1.658	.053	.212
9.5	76	32.434	1.697	.052	.195	72	32.222	1.741	.054	.205
10.5	73	32.945	1.833	.056	.215	67	32.985	2.168	.066	.265
11.5	79	32.874	1.816	.055	.204	55	33.400	2.254	.067	.304
12.5	57	33.983	2.358	.069	.312	67	34.149	2.261	.066	.276
13.5	66	34.939	2.724	.078	.335	55	34.964	2.358	.067	.318
14.5	68	35.603	2.722	.076	.330	69	35.391	2.396	.068	.288
15.5	49	36.388	2.877	.079	.411	56	35.804	2.573	.072	.344
16.5	45	37.800	2.389	.063	.356	43	35.488	1.910	.054	.291
17.5	36	38.333	1.985	.052	.331	38	35.526	2.653	.075	.430
18.5	30	37.533	2.445	.065	.446	14	34.786	2.177	.063	.582
19.5	10	39.300	1.615	.041	.511	8	36.000	.....	.....	.....
20.5	8	38.875	.....	.....	.....	1	37.000	.....	.....	.....

TABLE XXVIII. AGE CHANGES IN NOSE WIDTH (IN MILLIMETERS), *continued*

JAPANESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	74	30.121	1.732	.057	.201	56	29.929	1.752	.058	.234
7.5	105	30.629	1.587	.052	.155	118	30.076	1.661	.055	.153
8.5	108	31.055	1.783	.057	.172	96	30.354	1.682	.055	.172
9.5	99	31.626	1.682	.053	.169	96	30.833	1.741	.056	.178
10.5	101	31.931	1.841	.058	.183	103	31.514	1.916	.061	.189
11.5	82	32.122	2.069	.064	.228	85	32.035	2.117	.066	.230
12.5	106	32.708	1.936	.059	.188	89	32.752	2.007	.061	.212
13.5	102	33.618	2.385	.071	.236	92	33.978	1.643	.048	.171
14.5	124	35.008	2.361	.067	.212	73	33.849	2.025	.060	.237
15.5	107	35.701	2.223	.062	.215	64	33.844	2.145	.063	.268
16.5	89	36.596	2.402	.066	.255	29	34.241	1.995	.058	.370
17.5	60	37.017	2.069	.056	.267	18	34.500	2.522	.073	.594
18.5	38	37.553	2.510	.067	.407	13	35.000	2.037	.058	.565
19.5	15	36.733	2.175	.059	.561	4	37.000	.....	.....	.....
20.5	15	37.467	2.306	.061	.595	3	33.000	.....	.....	.....
Adult	10	36.600	.....	.....	.....	1	33.000	.....	.....	.....

KOREAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	4	37.250	.....	.....	.....	1	27.000	.....	.....	.....
6.5	4	30.750	.....	.....	.....	4	30.000	.....	.....	.....
7.5	7	30.143	.....	.....	.....	5	28.200	.....	.....	.....
8.5	6	31.333	.....	.....	.....	4	31.750	.....	.....	.....
9.5	8	32.750	.....	.....	.....	9	30.556	.....	.....	.....
10.5	13	31.231	1.421	.045	.394	6	32.333	.....	.....	.....
11.5	13	32.615	1.778	.055	.493	10	33.100	1.136	.034	.359
12.5	15	33.267	1.913	.058	.494	6	33.000	.....	.....	.....
13.5	14	33.643	3.108	.092	.831	12	33.917	2.020	.059	.583
14.5	18	35.778	1.903	.053	.449	10	35.700	2.193	.061	.694
15.5	9	34.222	.....	.....	.....	22	35.455	1.924	.054	.410
16.5	7	35.857	.....	.....	.....	9	35.220	.....	.....	.....
17.5	6	36.333	.....	.....	.....	4	34.750	.....	.....	.....
18.5	2	36.500	.....	.....	.....	....	.....	.....	.....	.....
19.5	2	37.000	.....	.....	.....	....	.....	.....	.....	.....
20.5	1	36.000	.....	.....	.....	....	.....	.....	.....	.....
Adult	4	38.500	.....	.....	.....	....	.....	.....	.....	.....

NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	26.000	.....	.....	.....	3	28.333	.....	.....	.....
6.5	21	27.809	1.562	.056	.341	18	28.000	1.764	.063	.416
7.5	34	28.471	1.703	.060	.292	29	27.414	1.404	.051	.261
8.5	33	28.727	1.503	.052	.262	38	28.711	2.211	.077	.359
9.5	49	28.837	2.198	.076	.314	31	28.677	1.786	.062	.321
10.5	50	29.440	1.676	.057	.237	28	28.786	1.934	.067	.365
11.5	40	29.500	2.037	.069	.322	21	29.571	2.083	.070	.455
12.5	33	30.242	2.000	.066	.348	41	30.195	1.744	.058	.272
13.5	37	30.676	2.406	.078	.396	41	31.415	1.622	.052	.253
14.5	38	32.158	2.047	.064	.332	49	31.347	2.105	.067	.301
15.5	38	32.632	2.960	.091	.480	42	31.714	1.944	.061	.300
16.5	23	33.478	2.447	.073	.510	35	31.657	1.565	.049	.265
17.5	17	34.941	1.625	.047	.394	26	31.692	2.126	.067	.417
18.5	4	33.250	.....	.....	.....	13	31.692	1.487	.047	.412
19.5	6	33.500	.....	.....	.....	5	32.600	.....	.....	.....
20.5	4	33.250	.....	.....	.....	1	30.000	.....	.....	.....
Adult	3	36.000	.....	.....	.....	12	33.500	2.328	.069	.672

TABLE XXVIII. AGE CHANGES IN NOSE WIDTH (IN MILLIMETERS), *continued*

SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	....	.....	.....	.....	.....	1	30.000	.....	.....	.....
6.5	30	28.100	1.700	.060	.310	28	27.250	2.010	.074	.380
7.5	52	28.500	1.926	.068	.267	50	28.080	2.133	.076	.302
8.5	37	28.514	1.685	.059	.277	53	28.453	2.220	.078	.305
9.5	43	29.674	1.609	.054	.245	56	29.411	1.720	.058	.230
10.5	47	29.681	1.822	.061	.266	51	30.059	2.052	.068	.287
11.5	54	30.185	2.020	.067	.275	54	30.278	2.147	.071	.292
12.5	55	30.364	2.392	.079	.323	64	31.156	2.588	.083	.324
13.5	43	31.511	2.140	.068	.326	61	31.262	2.202	.070	.282
14.5	35	32.200	2.352	.073	.398	55	32.018	2.285	.071	.308
15.5	19	33.421	2.980	.089	.684	40	31.875	2.452	.077	.388
16.5	12	33.333	2.778	.083	.802	29	31.724	2.766	.087	.514
17.5	7	35.571	.....	.....	.....	25	32.400	2.993	.092	.599
18.5	4	37.750	.....	.....	.....	8	32.125	.....	.....	.....
19.5	2	34.500	.....	.....	.....	8	31.250	.....	.....	.....
20.5	1	29.000	.....	.....	.....	4	30.250	.....	.....	.....
Adults	2	36.500	.....	.....	.....	2	31.500	.....	.....	.....

HAWAIIAN-ASIATIC

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	2	31.000	.....	.....	.....	1	32.000	.....	.....	.....
6.5	23	32.217	1.100	.034	.440	13	31.307	2.300	.073	.638
7.5	34	31.883	1.997	.063	.342	33	31.636	2.071	.066	.361
8.5	36	33.028	1.706	.052	.285	38	32.737	2.172	.066	.352
9.5	32	33.375	2.204	.066	.389	42	33.166	2.149	.065	.332
10.5	39	33.205	2.186	.066	.350	37	33.784	2.267	.067	.372
11.5	26	34.654	2.630	.076	.515	25	34.160	2.326	.068	.465
12.5	24	35.125	1.876	.053	.382	33	35.697	2.528	.071	.440
13.5	24	36.000	2.902	.081	.592	33	36.424	2.256	.062	.393
14.5	27	37.704	2.636	.070	.507	28	36.571	1.720	.047	.325
15.5	17	37.648	1.679	.044	.407	21	37.905	3.100	.082	.676
16.5	8	38.620	.....	.....	.....	30	37.866	2.030	.054	.371
17.5	7	41.000	.....	.....	.....	15	39.000	2.280	.059	.589
18.5	8	39.750	.....	.....	.....	15	38.066	2.720	.071	.702
19.5	8	41.000	.....	.....	.....	8	37.625	.....	.....	.....
Adult	33	40.878	2.683	.066	.467	30	38.466	2.604	.068	.475

HAWAIIAN-NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	31.000	.....	.....	.....	2	28.500	.....	.....	.....
6.5	25	30.640	2.017	.066	.403	20	30.350	1.559	.051	.348
7.5	33	31.273	2.619	.084	.456	36	30.027	2.218	.074	.370
8.5	47	31.426	2.369	.075	.346	38	31.105	2.500	.080	.406
9.5	36	31.500	2.291	.073	.382	47	31.000	2.249	.073	.328
10.5	45	32.311	2.200	.068	.328	47	32.021	2.540	.079	.370
11.5	57	32.123	2.760	.086	.366	54	32.519	2.910	.089	.396
12.5	47	33.659	2.683	.080	.392	35	32.943	2.858	.087	.483
13.5	41	34.195	3.118	.091	.486	57	34.316	2.891	.084	.383
14.5	40	35.150	3.276	.093	.517	49	34.449	2.674	.078	.382
15.5	31	35.452	2.526	.071	.453	53	34.566	3.069	.089	.422
16.5	19	37.368	3.391	.091	.777	38	35.658	2.993	.084	.486
17.5	31	37.387	3.404	.091	.611	37	35.351	3.130	.089	.515
18.5	18	40.111	2.807	.070	.662	25	34.320	2.950	.086	.590
19.5	13	37.231	2.914	.078	.808	13	35.615	3.432	.096	.952
Adult	69	40.638	3.730	.092	.449	79	36.913	3.227	.090	.374

TABLE XXVIII. AGE CHANGES IN NOSE WIDTH (IN MILLIMETERS), *continued*

HAWAIIAN-SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	27.000	.....	.....	.....	4	32.000	.....	.....	.....
6.5	8	30.500	.....	.....	.....	13	31.154	1.873	.060	.519
7.5	12	31.000	1.581	.051	.456	10	30.400	2.973	.098	.940
8.5	19	32.000	2.406	.075	.552	16	30.000	2.179	.073	.545
9.5	21	32.286	1.905	.059	.415	13	32.154	2.069	.064	.574
10.5	16	32.438	2.263	.070	.566	18	32.833	2.853	.087	.672
11.5	21	33.429	2.787	.083	.608	14	34.286	2.839	.083	.758
12.5	12	33.583	2.431	.072	.702	21	34.477	2.538	.074	.553
13.5	18	34.056	3.359	.099	.791	17	35.529	3.311	.093	.803
14.5	7	35.000	.....	.....	.....	12	35.667	2.687	.075	.776
15.5	12	37.417	3.947	.105	1.139	15	35.400	3.220	.091	.831
16.5	5	35.800	.....	.....	.....	9	36.330	.....	.....	.....
17.5	3	40.300	.....	.....	.....	9	36.770	.....	.....	.....
18.5	5	36.200	.....	.....	.....	....	.....	.....	.....	.....
Adult	19	42.316	3.197	.076	.733	....	.....	.....	.....	.....

HAWAIIAN-ASIATIC-EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	3	31.667	.....	.....	.....	3	30.660	.....	.....	.....
7.5	13	31.538	1.905	.060	.528	16	30.375	1.575	.052	.394
8.5	14	32.571	1.449	.044	.387	10	31.300	1.187	.038	.375
9.5	11	31.818	1.800	.056	.542	9	31.555	.....	.....	.....
10.5	12	32.500	1.849	.057	.534	15	32.200	3.816	.118	.985
11.5	11	32.455	1.158	.036	.349	12	33.833	2.610	.077	.753
12.5	11	33.091	2.678	.081	.807	12	34.833	3.412	.098	.985
13.5	11	33.455	.2818	.008	.085	10	33.700	2.283	.068	.722
14.5	12	34.917	2.289	.065	.661	16	36.125	2.522	.070	.631
15.5	4	38.000	.....	.....	.....	17	36.588	2.276	.062	.552
16.5	9	39.778	.....	.....	.....	10	37.800	3.280	.085	1.037
17.5	4	38.500	.....	.....	.....	10	35.200	1.721	.049	.544
18.5	1	39.000	.....	.....	.....	2	36.500	.....	.....	.....
19.5	1	40.000	.....	.....	.....	3	36.667	.....	.....	.....
20.5	1	41.000	.....	.....	.....	1	34.000	.....	.....	.....
Adult	....	.....	.....	.....	.....	4	35.000	.....	.....	.....

TABLE XXX. AGE CHANGES IN NASAL INDEX

HAWAIIAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	9	79.220	.....	.....	.....	6	81.166	.....	.....	.....
7.5	19	76.368	5.833	.076	1.338	28	78.071	6.094	.078	1.151
8.5	28	76.071	7.874	.103	1.487	36	75.278	5.294	.070	.882
9.5	29	75.034	6.196	.082	1.150	19	76.157	7.456	.098	1.710
10.5	39	74.589	5.917	.079	.947	35	75.914	6.231	.082	1.053
11.5	35	76.572	6.308	.082	1.066	21	75.239	6.031	.080	1.316
12.5	35	74.543	5.637	.076	.952	32	74.375	7.964	.107	1.407
13.5	30	76.067	8.120	.107	1.499	27	77.000	7.180	.093	1.381
14.5	35	77.771	7.885	.101	1.332	34	79.352	5.661	.071	.970
15.5	20	74.250	7.266	.098	1.624	27	77.074	4.831	.063	.929
16.5	16	76.875	7.114	.092	1.778	18	74.944	6.096	.081	1.436
17.5	10	77.700	4.776	.061	1.510	24	79.083	4.689	.059	.957
18.5	7	75.000	.....	.....	.....	12	75.000	5.902	.079	1.703
19.5	5	76.400	.....	.....	.....	9	81.333	.....	.....	.....
Adult	175	78.411	7.236	.092	.547	175	78.131	7.640	.098	.578

TABLE XXX. AGE CHANGES IN NASAL INDEX, *continued*

CHINESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	5	78.800	.....	.....	.....	9	78.445	.....	.....	.....
6.5	49	77.571	5.856	.075	.836	37	76.243	6.236	.082	1.025
7.5	82	77.903	6.852	.088	.757	77	75.519	5.872	.078	.669
8.5	70	75.529	6.583	.087	.787	60	75.033	5.977	.080	.772
9.5	76	75.013	5.734	.076	.658	72	75.958	6.615	.087	.780
10.5	73	75.657	5.929	.078	.694	67	76.090	7.020	.092	.858
11.5	79	74.886	6.117	.082	.688	55	75.600	5.633	.074	.759
12.5	57	76.000	6.161	.081	.816	67	75.060	6.574	.088	.803
13.5	66	72.364	6.730	.093	.828	54	74.481	5.347	.072	.728
14.5	68	74.912	6.263	.084	.759	69	76.420	6.116	.080	.736
15.5	49	73.306	5.708	.078	.815	56	75.857	6.460	.085	.863
16.5	45	77.111	6.714	.087	1.001	43	74.302	5.825	.078	.888
17.5	36	77.333	6.324	.082	1.054	37	77.297	5.637	.073	.927
18.5	30	72.800	6.155	.084	1.124	14	74.357	5.300	.071	1.416
19.5	10	77.000	5.568	.072	1.761	8	72.000	.....	.....	.....
20.5	8	74.500	.....	.....	.....	1	67.300	.....	.....	.....

JAPANESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	74	76.067	5.958	.078	.693	56	77.643	7.520	.097	1.005
7.5	104	73.913	6.334	.086	.625	116	74.216	5.958	.080	.553
8.5	108	73.833	5.833	.079	.561	93	73.021	5.645	.077	.585
9.5	99	74.606	5.745	.077	.577	95	73.095	6.505	.089	.667
10.5	101	74.059	6.209	.084	.617	101	72.475	6.165	.085	.613
11.5	80	72.687	6.902	.095	.772	83	72.084	6.430	.089	.706
12.5	104	72.673	5.843	.080	.573	89	73.011	6.638	.091	.704
13.5	102	72.833	6.131	.084	.607	92	74.152	5.834	.079	.608
14.5	123	75.358	6.345	.084	.572	73	73.589	5.822	.079	.681
15.5	106	73.575	5.733	.078	.557	64	72.562	5.940	.082	.743
16.5	89	73.685	7.031	.095	.745	29	71.276	4.961	.070	.921
17.5	60	73.216	5.212	.071	.675	18	73.667	5.822	.079	1.372
18.5	38	72.684	8.147	.112	1.322	13	72.231	5.293	.073	1.468
19.5	15	73.000	5.751	.079	1.458	4	74.425	.....	.....	.....
20.5	15	75.733	8.355	.113	2.157	3	75.650	.....	.....	.....
Adult	10	71.900	.....	.....	.....	1	73.300	.....	.....	.....

KOREAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	4	75.575	.....	.....	.....	1	84.400	.....	.....	.....
6.5	4	75.825	.....	.....	.....	4	74.050	.....	.....	.....
7.5	7	69.471	.....	.....	.....	5	67.660	.....	.....	.....
8.5	6	69.333	.....	.....	.....	4	77.025	.....	.....	.....
9.5	8	76.175	.....	.....	.....	9	72.356	.....	.....	.....
10.5	13	68.077	4.581	.067	1.270	6	72.180	.....	.....	.....
11.5	13	70.846	6.792	.096	1.884	10	70.700	3.607	.051	1.141
12.5	15	70.333	5.437	.077	1.404	6	71.258	.....	.....	.....
13.5	14	68.857	5.755	.084	1.538	12	71.833	5.031	.070	1.452
14.5	18	69.556	5.520	.079	1.301	10	75.300	4.051	.054	1.281
15.5	9	69.744	.....	.....	.....	22	73.000	5.649	.077	1.204
16.5	7	67.657	.....	.....	.....	9	71.555	.....	.....	.....
17.5	6	71.850	.....	.....	.....	4	67.650	.....	.....	.....
18.5	2	73.650	.....	.....	.....	....	.....	.....	.....	.....
19.5	2	65.550	.....	.....	.....	....	.....	.....	.....	.....
20.5	1	64.300	.....	.....	.....	....	.....	.....	.....	.....
Adult	4	67.000	.....	.....	.....	....	.....	.....	.....	.....

TABLE XXX. AGE CHANGES IN NASAL INDEX, *continued*

NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	52.000	.....	.....	.....	3	75.833	.....	.....	.....
6.5	21	69.524	4.031	.058	.880	17	69.824	4.395	.063	1.066
7.5	34	68.794	5.620	.082	.964	29	68.448	5.721	.084	1.062
8.5	32	68.812	5.457	.079	.965	38	69.500	5.968	.086	.968
9.5	48	67.771	5.781	.085	.834	31	68.161	5.340	.078	.959
10.5	50	68.680	6.683	.097	.945	28	66.536	6.395	.096	1.208
11.5	40	68.150	7.126	.105	1.127	21	66.714	6.219	.093	1.357
12.5	33	67.273	6.828	.101	1.189	41	67.439	6.544	.097	1.022
13.5	37	66.243	6.253	.094	1.028	41	68.732	5.682	.083	.887
14.5	38	68.053	6.091	.090	.988	49	66.837	6.222	.093	.889
15.5	38	65.842	6.289	.096	1.020	42	66.643	6.027	.090	.930
16.5	22	66.364	4.951	.075	1.056	34	65.529	4.447	.068	.763
17.5	17	69.353	4.814	.069	1.168	26	65.462	6.021	.092	1.181
18.5	4	63.500	.....	.....	.....	13	66.077	5.211	.079	1.445
19.5	6	66.187	.....	.....	.....	5	69.800	.....	.....	.....
20.5	4	64.250	.....	.....	.....	1	60.000	.....	.....	.....
Adult	3	68.133	.....	.....	.....	12	67.333	5.864	.087	1.693

SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	....	.....	.....	.....	.....	1	68.200	.....	.....	.....
6.5	30	71.267	5.072	.071	.926	28	72.000	8.414	.117	1.590
7.5	52	71.154	8.049	.113	1.116	49	71.082	6.694	.094	.956
8.5	37	70.162	7.790	.111	1.281	53	70.208	6.554	.093	.900
9.5	43	70.372	5.735	.081	.875	56	71.156	7.763	.109	1.037
10.5	47	69.149	6.421	.093	.937	51	71.078	7.388	.104	1.035
11.5	54	68.852	7.319	.106	.996	54	68.685	6.383	.093	.867
12.5	55	68.236	6.758	.099	.911	64	68.234	7.084	.104	.886
13.5	43	70.884	5.800	.082	.885	61	66.574	6.349	.095	.813
14.5	35	68.600	6.442	.094	1.089	55	67.964	5.948	.088	.802
15.5	19	70.684	5.685	.080	1.304	40	66.275	6.438	.097	1.018
16.5	12	67.833	7.163	.106	2.068	29	66.552	7.664	.115	1.423
17.5	7	69.857	.....	.....	.....	25	66.400	7.621	.115	1.524
18.5	4	76.300	.....	.....	.....	8	65.102	.....	.....	.....
19.5	2	71.250	.....	.....	.....	8	64.333	.....	.....	.....
20.5	1	54.700	.....	.....	.....	4	58.175	.....	.....	.....
Adult	2	69.650	.....	.....	.....	2	60.600	.....	.....	.....

HAWAIIAN-ASIATIC

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	2	76.500	.....	.....	.....	1	69.600	.....	.....	.....
6.5	23	78.044	6.002	.077	1.251	13	77.231	6.612	.086	1.834
7.5	34	76.295	5.819	.076	.997	33	75.848	6.210	.082	1.081
8.5	36	77.667	6.307	.081	1.051	38	75.737	6.192	.082	1.004
9.5	32	75.782	8.154	.107	1.441	42	75.881	5.602	.074	.865
10.5	39	74.898	6.976	.093	1.117	37	76.540	6.797	.089	1.117
11.5	26	75.884	7.127	.094	1.397	25	75.600	5.789	.077	1.158
12.5	24	74.333	4.989	.067	1.018	33	78.212	6.428	.082	1.119
13.5	24	74.792	4.301	.058	.877	33	76.969	5.844	.076	1.017
14.5	27	76.519	4.068	.053	.782	28	74.750	4.785	.064	.904
15.5	17	74.176	5.523	.074	1.339	21	79.476	6.953	.087	1.517
16.5	8	77.250	.....	.....	.....	30	76.200	4.956	.065	.905
17.5	7	80.200	.....	.....	.....	15	78.267	4.864	.062	1.256
18.5	8	78.990	.....	.....	.....	15	76.400	8.647	.113	2.233
19.5	8	81.400	.....	.....	.....	8	73.425	.....	.....	.....
Adult	33	75.667	6.008	.079	1.045	30	75.766	6.401	.084	1.168

TABLE XXX. AGE CHANGES IN NASAL INDEX, *continued*

HAWAIIAN-NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	75.600	.....	.....	.....	2	66.300	.....	.....	.....
6.5	25	75.240	6.958	.092	1.392	20	72.650	5.686	.078	1.271
7.5	33	73.394	6.880	.094	1.198	36	72.167	6.035	.084	1.006
8.5	47	74.043	6.826	.092	.995	38	73.500	7.440	.101	1.207
9.5	36	72.361	6.065	.084	1.011	46	71.630	6.572	.092	.969
10.5	45	73.000	7.315	.100	1.090	47	71.362	7.309	.102	1.066
11.5	57	69.298	7.153	.103	.947	54	70.611	6.567	.093	.894
12.5	47	72.872	7.115	.098	1.037	34	70.559	7.289	.103	1.250
13.5	41	72.195	6.321	.088	.987	57	72.404	5.956	.082	.789
14.5	40	71.875	6.893	.096	1.089	49	72.571	5.845	.081	.835
15.5	31	72.387	4.810	.066	.864	53	70.887	7.350	.104	1.010
16.5	31	73.774	7.755	.105	1.393	38	73.237	7.180	.098	1.165
17.5	19	72.210	6.437	.089	1.477	37	70.054	6.714	.096	1.104
18.5	18	74.167	6.466	.087	1.523	25	68.400	5.973	.087	1.195
19.5	13	72.615	6.184	.085	1.714	13	69.231	8.235	.119	2.284
Adult	69	75.159	7.708	.103	.928	79	71.848	7.455	.104	.839

HAWAIIAN-SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	81.800	.....	.....	.....	....	.....	.....	.....	.....
6.5	8	78.975	.....	.....	.....	4	81.250	.....	.....	.....
7.5	12	75.250	6.111	.081	1.764	13	76.661	6.558	.086	1.818
8.5	19	73.422	5.274	.072	1.209	10	72.100	6.139	.085	1.941
9.5	21	76.381	5.652	.074	1.233	16	69.875	7.424	.106	1.856
10.5	16	73.813	5.876	.080	1.469	13	73.231	6.963	.095	1.931
11.5	21	72.333	6.167	.085	1.345	18	71.333	6.056	.085	1.427
12.5	12	70.334	5.250	.075	1.515	14	71.714	5.921	.083	1.582
13.5	18	72.889	8.589	.118	2.024	21	72.286	5.658	.078	1.234
14.5	7	69.228	.....	.....	.....	17	73.118	6.570	.089	1.593
15.5	12	76.583	8.490	.111	2.451	12	72.084	8.549	.119	2.468
16.5	5	72.420	.....	.....	.....	15	71.667	7.115	.099	1.837
17.5	3	80.330	.....	.....	.....	9	72.444	.....	.....	.....
18.5	5	69.540	.....	.....	.....	9	76.866	.....	.....	.....
Adult	19	77.579	6.691	.086	1.534	....	.....	.....	.....	.....

HAWAIIAN-ASIATIC-EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	3	80.133	.....	.....	.....	3	75.700	.....	.....	.....
7.5	13	77.462	8.111	.105	2.249	16	72.937	5.640	.077	1.410
8.5	14	75.000	5.504	.073	1.471	10	73.400	3.499	.048	1.106
9.5	11	75.454	8.016	.106	2.416	9	73.589	.....	.....	.....
10.5	12	72.083	4.769	.066	1.377	15	68.867	3.739	.054	.965
11.5	11	72.727	5.462	.075	1.647	12	76.250	5.804	.076	1.676
12.5	11	72.091	7.489	.103	2.258	12	76.833	8.214	.107	2.371
13.5	11	71.636	4.965	.069	1.497	10	70.900	6.518	.092	2.061
14.5	12	72.000	6.880	.095	1.986	16	75.563	6.432	.085	1.608
15.5	4	72.100	.....	.....	.....	17	74.118	6.192	.084	1.502
16.5	9	77.389	.....	.....	.....	10	75.700	7.156	.095	2.263
17.5	4	77.575	.....	.....	.....	10	70.200	4.750	.068	1.502
18.5	1	75.000	.....	.....	.....	2	77.850	.....	.....	.....
19.5	1	83.300	.....	.....	.....	3	75.100	.....	.....	.....
20.5	1	100.000	.....	.....	.....	1	70.800	.....	.....	.....
Adult	....	.....	.....	.....	.....	4	67.800	.....	.....	.....

TABLE XXXI. AGE CHANGES IN EAR HEIGHT (IN MILLIMETERS)

HAWAIIAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	9	54.660	.....	.....	.....	6	54.833	.....	.....	.....
7.5	19	54.527	2.135	.039	.489	28	54.571	3.064	.056	.578
8.5	28	56.500	3.246	.057	.613	36	55.445	3.347	.060	.558
9.5	29	56.172	3.364	.060	.624	19	55.368	3.467	.063	.795
10.5	39	57.769	2.939	.051	.470	35	57.742	3.736	.065	.631
11.5	35	58.600	3.253	.056	.549	21	59.143	4.454	.075	.972
12.5	35	58.658	3.694	.063	.624	32	58.125	3.473	.060	.613
13.5	30	58.366	3.656	.063	.674	27	57.593	3.046	.053	.586
14.5	35	60.772	3.530	.058	.596	34	59.295	3.503	.059	.600
15.5	20	60.950	3.233	.053	.722	27	60.148	3.460	.058	.665
16.5	16	60.500	4.077	.067	1.019	18	60.778	3.206	.053	.755
17.5	10	63.300	4.755	.075	1.504	24	59.375	4.111	.069	.839
18.5	7	60.571	.....	.....	.....	12	60.083	2.216	.037	.640
19.5	5	63.600	.....	.....	.....	9	62.000	.....	.....	.....
Adult	206	66.083	4.545	.069	.316	175	63.674	4.513	.071	.341

CHINESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	5	50.800	.....	.....	.....	9	50.667	.....	.....	.....
6.5	49	51.898	3.530	.068	.504	37	51.216	3.265	.064	.537
7.5	82	52.366	3.277	.062	.362	77	53.117	3.126	.059	.356
8.5	70	54.157	2.802	.052	.335	61	53.639	3.254	.061	.417
9.5	76	54.763	3.363	.061	.386	73	54.055	3.534	.065	.414
10.5	73	54.808	3.833	.070	.449	67	54.716	3.831	.070	.468
11.5	79	54.810	3.406	.062	.383	55	55.200	3.497	.063	.472
12.5	57	56.544	3.888	.069	.515	67	55.702	3.633	.065	.444
13.5	66	57.151	3.779	.066	.465	55	56.309	3.236	.057	.436
14.5	68	57.927	3.089	.053	.375	69	56.899	4.000	.070	.482
15.5	49	58.796	3.481	.059	.497	56	57.321	3.186	.056	.426
16.5	45	58.178	2.869	.049	.428	42	57.214	3.629	.063	.560
17.5	36	59.445	3.476	.058	.579	37	57.676	3.409	.059	.560
18.5	30	60.333	3.797	.063	.693	14	56.214	1.970	.035	.526
19.5	10	59.500	2.540	.042	.803	8	57.875	.....	.....	.....
20.5	8	60.500	.....	.....	.....	1	66.000	.....	.....	.....

JAPANESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	74	52.784	3.033	.057	.352	57	52.246	3.872	.074	.513
7.5	105	53.724	3.376	.063	.329	119	53.420	3.061	.057	.280
8.5	108	55.120	3.208	.058	.309	96	53.833	2.711	.050	.277
9.5	99	55.162	3.212	.058	.323	96	55.489	3.126	.056	.319
10.5	101	55.653	3.552	.064	.353	103	55.262	3.288	.059	.324
11.5	82	55.905	2.956	.053	.326	85	55.565	4.004	.072	.434
12.5	106	56.377	3.572	.063	.347	89	55.921	3.705	.066	.393
13.5	102	57.961	3.648	.063	.361	92	57.402	3.527	.061	.368
14.5	124	59.290	3.452	.058	.310	73	57.849	3.366	.058	.394
15.5	107	59.580	3.604	.060	.348	64	58.281	3.719	.064	.465
16.5	89	60.225	3.783	.063	.401	29	59.345	3.632	.061	.674
17.5	60	60.867	3.237	.053	.418	18	58.056	3.597	.062	.848
18.5	38	60.289	2.872	.048	.466	13	58.769	3.886	.066	1.078
19.5	15	59.067	3.396	.057	.877	4	59.500	.....	.....	.....
20.5	15	60.467	3.461	.057	.894	3	55.000	.....	.....	.....
Adult	10	62.500	.....	.....	.....	1	60.000	.....	.....	.....

TABLE XXXI. AGE CHANGES IN EAR HEIGHT (IN MILLIMETERS) *continued*

KOREAN

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	4	50.500	.....	.....	.....	1	44.000	.....	.....	.....
6.5	4	51.250	.....	.....	.....	4	51.500	.....	.....	.....
7.5	7	53.857	.....	.....	.....	5	52.800	.....	.....	.....
8.5	6	53.000	.....	.....	.....	4	55.250	.....	.....	.....
9.5	8	54.500	.....	.....	.....	9	54.444	.....	.....	.....
10.5	13	56.000	3.211	.057	.890	6	58.666	.....	.....	.....
11.5	13	57.769	2.914	.050	.808	10	55.100	3.145	.057	.995
12.5	15	57.400	2.704	.047	.698	6	57.000	.....	.....	.....
13.5	14	56.714	1.905	.034	.509	12	57.000	2.915	.051	.842
14.5	18	60.056	3.118	.052	.735	10	57.900	3.113	.054	.985
15.5	9	57.333	.....	.....	.....	22	58.682	3.376	.058	.720
16.5	7	59.429	.....	.....	.....	9	59.330	.....	.....	.....
17.5	6	58.833	.....	.....	.....	4	59.500	.....	.....	.....
18.5	2	57.500	.....	.....	.....	....	.....	.....	.....	.....
19.5	2	60.000	.....	.....	.....	....	.....	.....	.....	.....
20.5	1	71.000	.....	.....	.....	....	.....	.....	.....	.....
Adult	1	63.250	.....	.....	.....	....	.....	.....	.....	.....

NORTH EUROPEAN

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	55.000	.....	.....	.....	3	52.667	.....	.....	.....
6.5	21	53.905	3.854	.071	.841	18	53.167	3.655	.069	.861
7.5	34	54.176	3.294	.061	.565	29	54.448	3.701	.068	.687
8.5	33	56.061	3.481	.062	.606	38	54.184	2.827	.052	.459
9.5	49	56.347	3.068	.054	.438	31	55.323	3.176	.057	.570
10.5	49	57.000	2.755	.048	.394	28	55.750	3.409	.061	.644
11.5	40	57.950	3.695	.064	.584	21	57.000	2.636	.046	.575
12.5	33	57.939	2.860	.049	.498	41	57.634	3.817	.066	.596
13.5	37	59.649	3.289	.055	.541	41	58.756	3.428	.058	.535
14.5	38	58.737	3.697	.063	.600	49	57.551	2.900	.050	.414
15.5	38	60.158	2.970	.049	.482	42	58.071	3.641	.063	.562
16.5	23	60.696	2.851	.047	.594	33	58.818	3.059	.052	.532
17.5	17	62.765	3.933	.063	.954	26	58.577	3.015	.051	.591
18.5	4	59.250	.....	.....	.....	13	57.077	4.029	.071	1.117
19.5	6	61.000	.....	.....	.....	5	57.600	.....	.....	.....
20.5	4	59.000	.....	.....	.....	1	51.000	.....	.....	.....
Adult	3	65.333	.....	.....	.....	12	63.417	4.804	.076	1.387

SOUTH EUROPEAN

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	....	.....	.....	.....	.....	1	51.000	.....	.....	.....
6.5	30	53.567	4.455	.083	.813	28	52.107	3.985	.076	.753
7.5	52	53.904	3.066	.057	.425	50	52.060	3.385	.065	.479
8.5	37	54.486	3.950	.072	.649	53	53.358	3.134	.059	.430
9.5	43	54.860	2.938	.054	.448	56	54.179	3.708	.068	.496
10.5	47	56.426	3.312	.059	.483	51	55.490	3.415	.062	.478
11.5	54	56.463	3.447	.061	.469	54	55.852	3.941	.071	.536
12.5	55	56.491	3.536	.063	.477	64	56.672	3.654	.064	.457
13.5	44	58.000	3.948	.068	.595	61	57.180	4.060	.071	.520
14.5	35	58.800	3.678	.063	.622	55	57.345	3.640	.063	.491
15.5	19	59.105	3.127	.053	.717	40	57.300	3.945	.069	.624
16.5	12	60.417	3.499	.058	1.010	29	57.379	3.378	.058	.627
17.5	7	58.286	.....	.....	.....	24	57.083	3.303	.058	.674
18.5	4	60.750	.....	.....	.....	8	59.000	.....	.....	.....
19.5	2	58.000	.....	.....	.....	8	59.000	.....	.....	.....
20.5	1	57.000	.....	.....	.....	4	58.750	.....	.....	.....
Adult	2	62.000	.....	.....	.....	2	58.500	.....	.....	.....

TABLE XXXI. AGE CHANGES IN EAR HEIGHT (IN MILLIMETERS) *continued*

HAWAIIAN-ASIATIC

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	2	47.000	.....	.....	.....	1	56.000	.....	.....	.....
6.5	23	53.000	2.553	.048	.532	13	51.846	2.381	.046	.660
7.5	34	54.294	2.651	.049	.454	33	53.636	2.760	.051	.481
8.5	36	55.444	2.919	.053	.486	38	55.079	2.968	.054	.481
9.5	32	55.032	4.779	.087	.844	42	54.619	3.381	.062	.522
10.5	39	56.538	3.410	.060	.546	37	55.378	3.513	.063	.577
11.5	26	55.731	3.335	.060	.654	25	56.560	3.336	.059	.667
12.5	24	56.958	3.813	.067	.778	33	57.606	3.209	.056	.559
13.5	24	57.667	2.795	.048	.570	33	58.031	3.434	.059	.598
14.5	27	59.037	3.677	.062	.707	28	58.679	3.545	.060	.599
15.5	17	60.470	3.758	.062	.911	21	59.428	3.001	.051	.655
16.5	8	60.000	.....	.....	.....	30	59.967	2.915	.049	.532
17.5	7	62.300	.....	.....	.....	15	60.000	3.483	.058	.899
18.5	8	59.620	.....	.....	.....	15	59.400	3.441	.058	.888
19.5	8	62.620	.....	.....	.....	8	59.625	.....	.....	.....
Adult	33	63.696	4.680	.073	.814	30	60.800	4.094	.067	.747

HAWAIIAN-NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	56.000	.....	.....	.....	2	57.500	.....	.....	.....
6.5	25	53.680	3.997	.075	.799	20	55.400	2.417	.044	.540
7.5	33	54.152	3.775	.070	.657	36	55.139	3.400	.062	.567
8.5	47	55.043	3.614	.066	.527	38	54.789	3.245	.059	.526
9.5	36	55.528	3.468	.062	.578	47	54.766	3.501	.064	.511
10.5	45	57.133	3.038	.053	.453	47	56.915	3.300	.058	.481
11.5	57	57.140	3.547	.062	.470	54	56.982	3.035	.053	.413
12.5	47	58.425	4.196	.072	.612	35	57.571	3.183	.055	.534
13.5	41	59.244	3.169	.053	.495	57	57.807	3.644	.063	.483
14.5	40	60.250	3.375	.056	.533	50	58.940	3.338	.057	.472
15.5	31	60.161	3.254	.054	.584	53	58.943	3.305	.056	.454
16.5	31	60.677	3.728	.061	.669	38	59.553	3.250	.055	.527
17.5	19	61.631	2.559	.042	.587	36	59.556	2.958	.050	.493
18.5	18	61.000	2.828	.046	.666	24	58.667	3.312	.056	.736
19.5	13	62.154	1.873	.030	.519	13	57.846	3.718	.064	1.031
Adult	70	65.000	4.919	.076	.588	79	63.215	5.086	.080	.572

HAWAIIAN-SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	50.000	.....	.....	.....	....	.....	.....	.....	.....
6.5	8	53.000	.....	.....	.....	4	54.250	.....	.....	.....
7.5	12	54.084	4.838	.089	1.396	13	54.615	2.924	.054	.811
8.5	19	55.579	2.623	.047	.602	10	55.100	3.780	.069	1.195
9.5	21	55.429	2.107	.038	.460	16	53.500	2.623	.049	.656
10.5	16	55.875	2.689	.048	.672	13	55.000	3.637	.066	1.008
11.5	21	57.095	2.287	.040	.499	18	56.611	3.111	.055	.733
12.5	12	59.166	2.672	.045	.771	14	55.643	2.159	.039	.576
13.5	18	57.556	3.578	.062	.843	21	57.190	4.542	.079	.991
14.5	7	59.285	.....	.....	.....	17	60.176	2.480	.041	.601
15.5	12	59.750	4.044	.068	1.167	12	59.750	2.919	.049	.843
16.5	5	58.800	.....	.....	.....	15	58.733	3.276	.056	.846
17.5	3	63.300	.....	.....	.....	9	57.666	.....	.....	.....
18.5	5	60.600	.....	.....	.....	9	58.330	.....	.....	.....
Adult	19	64.789	5.297	.082	1.215	....	.....	.....	.....	.....

TABLE XXXI. AGE CHANGES IN EAR HEIGHT (IN MILLIMETERS) *continued*

HAWAIIAN-ASIATIC-EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	3	54.667	.....	.....	.....	3	54.000	.....	.....	.....
7.5	13	54.923	2.644	.048	.733	16	54.500	2.265	.042	.566
8.5	14	55.714	3.127	.056	.836	10	55.400	2.835	.051	.896
9.5	11	56.091	3.203	.057	.966	9	54.555	.....	.....	.....
10.5	12	57.083	2.753	.048	.794	15	55.800	3.351	.060	.865
11.5	11	56.727	2.864	.050	.863	12	56.417	3.303	.059	.954
12.5	11	57.727	3.387	.059	1.021	12	57.500	3.253	.056	.939
13.5	11	58.091	3.604	.062	1.086	10	57.100	4.721	.083	1.493
14.5	12	59.883	2.375	.040	.685	16	59.000	3.279	.055	.820
15.5	4	62.500	.....	.....	.....	16	59.687	3.787	.063	.947
16.5	9	61.444	.....	.....	.....	10	60.700	3.796	.062	1.200
17.5	4	59.250	.....	.....	.....	10	57.300	2.968	.052	.939
18.5	1	56.000	.....	.....	.....	2	61.500	.....	.....	.....
19.5	1	53.000	.....	.....	.....	3	60.000	.....	.....	.....
20.5	1	60.000	.....	.....	.....	1	62.000	.....	.....	.....
Adult	....	.....	.....	.....	.....	4	60.000	.....	.....	.....

TABLE XXXII. AGE CHANGES IN EAR WIDTH (IN MILLIMETERS)

HAWAIIAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	9	31.330	.....	.....	.....	6	32.166	.....	.....	.....
7.5	19	32.210	1.822	.056	.417	28	30.964	2.128	.069	.402
8.5	28	32.392	3.132	.097	.591	36	31.250	2.608	.083	.434
9.5	29	31.275	2.147	.069	.398	19	31.053	2.211	.071	.507
10.5	39	32.333	2.324	.072	.372	35	31.829	2.375	.075	.401
11.5	35	32.057	2.163	.067	.365	21	32.238	2.347	.073	.512
12 5	35	32.542	2.209	.068	.373	32	32.125	2.702	.084	.477
13.5	30	31.767	2.347	.074	.433	27	31.334	2.037	.065	.392
14.5	35	32.514	2.478	.076	.418	34	32.088	2.227	.069	.381
15.5	20	31.600	2.223	.070	.497	27	31.703	2.594	.082	.499
16.5	16	32.437	2.805	.086	.701	18	33.167	1.980	.060	.466
17.5	10	32.500	.....	.....	.....	24	31.667	2.561	.081	.523
18.5	7	32.428	.....	.....	.....	12	33.416	2.466	.074	.712
19.5	5	34.400	.....	.....	.....	9	33.000	.....	.....	.....
Adult	206	34.132	2.927	.086	.203	175	33.297	2.798	.084	.211

CHINESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	5	28.600	.....	.....	.....	9	27.556	.....	.....	.....
6.5	49	29.347	2.653	.090	.379	37	28.459	2.553	.090	.420
7.5	82	29.012	1.871	.064	.207	77	28.195	2.528	.089	.288
8.5	70	29.700	2.302	.077	.257	61	29.115	2.853	.098	.365
9.5	76	29.605	2.857	.096	.328	73	29.151	2.625	.090	.307
10.5	73	29.521	2.472	.084	.289	67	29.175	2.500	.086	.031
11.5	79	29.089	2.435	.084	.274	55	28.127	2.054	.073	.277
12.5	57	30.105	2.705	.090	.358	67	28.881	2.617	.091	.320
13.5	66	30.182	2.907	.096	.358	55	28.527	2.500	.088	.337
14.5	68	30.103	2.468	.082	.299	69	29.348	2.625	.089	.316
15.5	49	29.837	2.846	.102	.406	56	28.518	2.731	.096	.365
16.5	45	29.311	2.218	.076	.331	42	28.738	2.341	.081	.361
17.5	36	30.472	2.862	.094	.477	37	30.027	2.476	.082	.407
18.5	30	30.000	2.544	.084	.464	14	28.857	2.642	.092	.706
19.5	10	28.400	3.072	.108	.971	8	29.625	.....	.....	.....
20.5	8	29.375	.....	.....	.....	1	34.000	.....	.....	.....

TABLE XXXII. AGE CHANGES IN EAR WIDTH (IN MILLIMETERS), *continued*

JAPANESE

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	74	29.582	2.142	.072	.249	57	29.263	2.598	.089	.344
7.5	105	29.972	2.486	.083	.243	119	28.950	2.764	.095	.253
8.5	108	30.259	2.100	.069	.202	96	29.187	2.488	.085	.254
9.5	99	30.071	2.375	.079	.239	96	29.208	2.415	.083	.246
10.5	101	29.455	2.728	.093	.271	103	29.304	2.534	.086	.250
11.5	82	30.000	2.538	.085	.280	85	29.553	2.698	.091	.293
12.5	106	30.226	3.000	.099	.291	89	29.135	2.731	.094	.289
13.5	102	30.392	2.903	.095	.287	92	28.935	2.759	.095	.288
14.5	124	30.573	2.676	.088	.240	73	29.630	2.707	.091	.317
15.5	107	29.991	2.681	.090	.259	64	29.672	2.506	.084	.313
16.5	89	30.303	2.492	.082	.264	29	29.621	2.834	.096	.526
17.5	60	29.883	2.524	.084	.326	18	29.889	2.025	.068	.477
18.5	38	29.605	2.466	.083	.400	13	29.077	2.526	.087	.700
19.5	15	29.467	2.604	.088	.672	4	27.250	.....	.....	.....
20.5	15	29.200	2.343	.080	.605	3	30.667	.....	.....	.....
Adult	10	30.300	.....	.....	.....	1	32.000	.....	.....	.....

KOREAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	4	29.750	.....	.....	.....	1	27.000	.....	.....	.....
6.5	4	27.250	.....	.....	.....	4	28.250	.....	.....	.....
7.5	7	28.714	.....	.....	.....	5	30.000	.....	.....	.....
8.5	6	28.833	.....	.....	.....	4	28.725	.....	.....	.....
9.5	8	29.375	.....	.....	.....	9	27.222	.....	.....	.....
10.5	13	28.615	2.095	.073	.581	6	29.166	.....	.....	.....
11.5	13	29.538	2.062	.070	.572	10	26.900	1.921	.071	.608
12.5	15	29.133	2.247	.077	.580	6	29.167	.....	.....	.....
13.5	14	27.857	2.532	.091	.677	12	28.333	2.054	.072	.593
14.5	18	29.333	3.092	.105	.729	10	28.300	2.452	.087	.775
15.5	9	27.777	.....	.....	.....	22	29.091	2.827	.097	.603
16.5	7	28.714	.....	.....	.....	9	28.110	.....	.....	.....
17.5	6	28.167	.....	.....	.....	4	26.750	.....	.....	.....
18.5	2	27.000	.....	.....	.....	....	.....	.....	.....	.....
19.5	2	30.000	.....	.....	.....	....	.....	.....	.....	.....
20.5	1	34.000	.....	.....	.....	....	.....	.....	.....	.....
Adult	4	31.750	.....	.....	.....	....	.....	.....	.....	.....

NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	32.000	.....	.....	.....	3	30.667	.....	.....	.....
6.5	21	30.714	2.272	.074	.496	18	30.333	2.625	.087	.619
7.5	34	30.676	2.631	.086	.451	29	30.724	2.133	.069	.396
8.5	33	30.697	1.783	.058	.310	38	30.421	2.112	.069	.343
9.5	49	31.143	2.381	.076	.340	31	30.290	2.385	.079	.428
10.5	50	30.740	3.110	.101	.440	28	30.321	3.901	.129	.737
11.5	40	31.225	2.769	.089	.438	21	30.714	2.433	.079	.531
12.5	33	31.121	2.590	.083	.451	41	31.024	2.893	.093	.452
13.5	37	32.351	2.644	.082	.435	41	31.366	2.496	.080	.390
14.5	38	32.947	2.437	.074	.395	49	31.143	2.733	.088	.390
15.5	38	32.684	2.362	.072	.383	42	31.643	3.038	.096	.469
16.5	23	32.783	2.484	.076	.518	33	32.303	2.691	.083	.468
17.5	17	32.353	2.520	.078	.611	26	31.231	2.454	.079	.481
18.5	4	34.500	.....	.....	.....	13	30.538	3.129	.102	.868
19.5	6	32.333	.....	.....	.....	4	31.500	.....	.....	.....
20.5	4	33.500	.....	.....	.....	1	28.000	.....	.....	.....
Adult	3	35.667	.....	.....	.....	12	32.583	2.753	.084	.795

TABLE XXXII. AGE CHANGES IN EAR WIDTH (IN MILLIMETERS), *continued*

SOUTH EUROPEAN

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	....	.....	.....	.....	.....	1	29.000	.....	.....	.....
6.5	30	30.400	2.402	.079	.439	28	30.071	2.328	.077	.440
7.5	52	30.731	2.512	.082	.348	50	29.580	2.585	.087	.366
8.5	37	30.243	3.357	.111	.552	53	30.377	2.594	.085	.356
9.5	43	30.837	1.892	.061	.289	56	30.125	2.500	.083	.334
10.5	47	31.000	2.657	.086	.388	51	30.843	2.173	.070	.304
11.5	54	31.056	2.289	.074	.312	54	30.463	2.973	.098	.405
12.5	55	31.436	2.544	.081	.343	64	31.484	2.555	.081	.319
13.5	44	31.841	2.276	.071	.343	61	31.049	2.161	.070	.277
14.5	35	32.371	2.982	.092	.504	55	30.964	2.853	.092	.385
15.5	19	31.474	2.520	.080	.578	40	30.750	2.606	.085	.412
16.5	12	32.167	2.035	.063	.587	29	30.414	2.567	.084	.477
17.5	7	31.143	.....	.....	.....	24	29.750	2.107	.071	.430
18.5	4	30.000	.....	.....	.....	8	31.250	.....	.....	.....
19.5	2	30.000	.....	.....	.....	8	29.625	.....	.....	.....
20.5	1	33.000	.....	.....	.....	4	34.250	.....	.....	.....
Adult	2	34.000	.....	.....	.....	2	35.000	.....	.....	.....

HAWAIIAN-ASIATIC

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	2	28.500	.....	.....	.....	1	33.000	.....	.....	.....
6.5	23	30.304	2.311	.076	.481	13	29.384	2.130	.073	.598
7.5	34	30.029	2.371	.079	.406	33	30.090	2.391	.079	.416
8.5	36	30.944	2.147	.069	.357	38	30.500	2.009	.066	.326
9.5	32	30.782	2.848	.092	.503	42	30.572	2.431	.080	.375
10.5	39	31.283	2.124	.068	.340	37	29.676	3.050	.102	.501
11.5	26	31.000	2.149	.069	.421	25	30.840	1.868	.061	.374
12.5	24	31.291	2.245	.072	.458	33	30.121	2.421	.080	.421
13.5	24	30.125	2.107	.070	.430	33	31.030	2.896	.093	.504
14.5	27	31.741	2.784	.088	.535	28	30.214	2.526	.084	.477
15.5	17	31.117	2.762	.089	.669	21	31.619	2.609	.083	.569
16.5	8	31.000	.....	.....	.....	30	31.834	2.368	.074	.432
17.5	7	31.400	.....	.....	.....	14	30.072	2.711	.090	.724
18.5	8	30.200	.....	.....	.....	15	31.334	3.477	.111	.898
19.5	8	31.750	.....	.....	.....	8	32.625	.....	.....	.....
Adult	33	32.250	2.948	.091	.521	30	31.566	3.344	.106	.611

HAWAIIAN-NORTH EUROPEAN

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	35.000	.....	.....	.....	2	28.500	.....	.....	.....
6.5	25	31.440	2.744	.087	.549	20	31.200	1.806	.058	.404
7.5	33	30.333	2.846	.094	.495	36	30.889	2.131	.069	.355
8.5	47	30.192	2.456	.081	.358	38	31.053	2.524	.081	.409
9.5	36	30.694	2.504	.082	.417	47	30.936	2.678	.087	.391
10.5	45	31.622	2.839	.090	.423	47	30.745	2.347	.076	.342
11.5	57	30.895	2.366	.077	.313	54	30.537	2.787	.091	.379
12.5	47	31.276	2.040	.065	.297	35	32.029	2.700	.084	.456
13.5	41	31.976	2.832	.089	.442	57	30.772	2.968	.096	.393
14.5	40	31.900	2.191	.069	.346	50	31.340	2.177	.069	.308
15.5	31	32.129	2.195	.068	.394	53	30.925	2.760	.089	.379
16.5	31	31.613	3.087	.098	.554	38	31.500	2.186	.069	.354
17.5	19	32.316	2.177	.067	.499	36	31.472	2.488	.079	.415
18.5	18	31.722	1.628	.051	.383	24	31.333	1.819	.058	.371
19.5	13	32.461	1.780	.055	.494	13	32.923	3.519	.107	.976
Adult	70	33.771	2.722	.081	.325	78	32.654	2.990	.092	.339

TABLE XXXII. AGE CHANGES IN EAR WIDTH (IN MILLIMETERS), *continued*

HAWAIIAN-SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	31.000	.....	.....	.....	....	.....	.....	.....	.....
6.5	8	30.250	.....	.....	.....	4	30.750	.....	.....	.....
7.5	12	31.250	3.562	.114	1.028	13	30.077	2.017	.067	.559
8.5	19	30.316	2.225	.073	.510	10	30.500	2.958	.097	.935
9.5	21	30.095	2.328	.077	.507	16	30.187	2.298	.076	.575
10.5	16	31.625	1.900	.060	.475	13	30.462	2.530	.083	.701
11.5	21	30.867	2.528	.082	.552	18	30.667	2.427	.079	.572
12.5	12	32.000	2.613	.082	.754	14	30.429	2.612	.086	.698
13.5	18	30.945	3.223	.104	.759	21	30.428	2.700	.089	.589
14.5	7	30.571	.....	.....	.....	17	31.942	2.960	.093	.717
15.5	12	31.333	3.118	.099	.900	12	31.083	2.722	.088	.785
16.5	5	30.800	.....	.....	.....	15	29.667	2.522	.085	.651
17.5	3	33.300	.....	.....	.....	9	30.440	.....	.....	.....
18.5	5	34.200	.....	.....	.....	9	30.110	.....	.....	.....
Adult	19	34.422	2.944	.086	.675	....	.....	.....	.....	.....

HAWAIIAN-ASIATIC-EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	3	31.000	.....	.....	.....	3	29.330	.....	.....	.....
7.5	13	30.000	1.797	.060	.498	16	30.000	2.236	.075	.559
8.5	14	31.214	2.366	.076	.632	10	30.900	2.791	.090	.883
9.5	11	32.000	2.764	.086	.833	9	29.111	.....	.....	.....
10.5	12	30.500	1.980	.065	.571	15	31.267	2.886	.091	.744
11.5	11	30.273	2.798	.092	.844	12	29.750	2.005	.067	.579
12.5	11	31.273	1.712	.055	.516	12	30.000	1.916	.064	.553
13.5	11	30.182	2.623	.087	.790	10	29.200	1.661	.057	.525
14.5	12	30.917	1.892	.061	.546	16	29.437	2.179	.074	.545
15.5	4	32.250	.....	.....	.....	16	31.000	2.032	.066	.508
16.5	9	32.333	.....	.....	.....	10	32.000	2.490	.078	.787
17.5	4	31.000	.....	.....	.....	10	30.200	3.059	.010	.967
18.5	1	29.000	.....	.....	.....	2	34.000	.....	.....	.....
19.5	1	36.000	.....	.....	.....	3	33.000	.....	.....	.....
20.5	1	25.000	.....	.....	.....	1	36.000	.....	.....	.....
Adult	....	.....	.....	.....	.....	4	31.250	.....	.....	.....

TABLE XXXIII. AGE CHANGES IN EAR INDEX

HAWAIIAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	9	57.330	.....	.....	.....	6	58.666	.....	.....	.....
7.5	19	59.106	2.990	.051	.685	28	56.821	4.433	.078	.837
8.5	28	58.500	6.155	.105	1.163	36	56.473	4.775	.084	.795
9.5	29	55.828	4.136	.074	.768	19	56.368	4.759	.084	1.091
10.5	39	56.076	4.305	.077	.689	35	55.115	4.214	.076	.712
11.5	35	54.743	3.350	.061	.566	21	54.666	3.441	.063	.750
12.5	35	55.715	4.151	.074	.701	32	55.156	2.648	.048	.468
13.5	30	54.600	4.168	.076	.769	27	54.593	4.112	.075	.791
14.5	35	53.571	3.995	.074	.675	34	54.264	4.616	.085	.791
15.5	19	51.948	3.735	.072	.856	27	52.888	5.412	.102	1.041
16.5	16	53.562	3.061	.057	.765	18	54.778	3.980	.073	.938
17.5	10	52.500	5.971	.113	1.988	24	53.416	4.991	.093	1.018
18.5	7	53.428	.....	.....	.....	12	55.833	3.976	.071	1.148
19.5	5	54.200	.....	.....	.....	9	53.222	.....	.....	.....
Adult	206	51.743	3.972	.077	.276	175	52.422	4.371	.083	.330

TABLE XXXIII. AGE CHANGES IN EAR INDEX, *continued*

CHINESE

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	5	56.400	.....	.....	.....	9	54.223	.....	.....	.....
6.5	49	56.612	4.448	.078	.635	37	55.676	4.429	.079	.728
7.5	82	55.561	3.622	.065	.400	77	53.091	4.007	.075	.457
8.5	70	54.572	4.213	.077	.503	61	54.377	5.090	.094	.651
9.5	76	54.329	4.289	.079	.492	73	53.973	4.505	.083	.527
10.5	73	53.960	4.543	.084	.532	67	53.522	4.540	.084	.555
11.5	79	53.279	4.963	.093	.558	55	51.255	4.015	.078	.541
12.5	57	53.281	4.238	.079	.561	67	52.388	5.040	.096	.616
13.5	66	52.833	4.443	.084	.547	55	50.618	4.494	.089	.606
14.5	68	52.015	4.610	.089	.559	69	51.696	5.002	.097	.602
15.5	49	50.796	4.222	.083	.603	56	50.500	6.021	.119	.805
16.5	45	50.421	4.047	.080	.603	42	50.500	4.542	.090	.701
17.5	36	51.389	5.159	.100	.860	37	52.216	5.063	.097	.832
18.5	30	49.867	3.500	.070	.639	14	51.429	4.953	.096	1.324
19.5	10	47.600	4.079	.086	1.290	8	51.000	.....	.....	.....
20.5	8	48.875	.....	.....	.....	1	51.500	.....	.....	.....

JAPANESE

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	74	56.216	4.214	.075	.490	57	56.210	5.227	.093	.692
7.5	105	56.086	4.684	.084	.457	119	54.403	5.101	.094	.468
8.5	108	55.009	3.850	.069	.370	96	54.344	4.457	.082	.455
9.5	99	54.394	4.271	.079	.429	96	52.719	4.650	.088	.474
10.5	101	53.228	4.573	.086	.455	103	52.942	4.513	.085	.445
11.5	82	53.817	4.356	.081	.481	85	53.294	4.214	.079	.457
12.5	106	53.613	4.401	.082	.427	89	52.258	4.971	.095	.527
13.5	102	52.725	5.126	.097	.508	92	50.576	4.760	.094	.496
14.5	124	51.492	4.182	.081	.375	73	51.342	4.721	.092	.553
15.5	107	50.346	4.321	.086	.418	64	51.156	5.142	.101	.643
16.5	88	50.489	4.604	.091	.491	29	50.103	5.498	.109	1.021
17.5	60	49.350	4.369	.088	.564	18	51.778	4.589	.089	1.082
18.5	37	49.216	4.199	.085	.690	13	49.615	5.314	.107	1.474
19.5	15	50.000	5.341	.107	1.379	4	45.700	.....	.....	.....
20.5	15	48.333	4.077	.084	1.053	3	55.633	.....	.....	.....
Adult	10	48.500	.....	.....	.....	1	53.300	.....	.....	.....

KOREAN

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	4	59.050	.....	.....	.....	1	61.400	.....	.....	.....
6.5	4	52.825	.....	.....	.....	4	54.550	.....	.....	.....
7.5	7	53.429	.....	.....	.....	5	56.820	.....	.....	.....
8.5	6	54.483	.....	.....	.....	4	51.950	.....	.....	.....
9.5	8	53.950	.....	.....	.....	9	50.122	.....	.....	.....
10.5	13	51.308	3.910	.076	1.084	6	50.333	.....	.....	.....
11.5	13	51.154	2.476	.048	.687	10	48.900	4.182	.086	1.323
12.5	15	50.867	3.931	.077	1.015	6	51.208	.....	.....	.....
13.5	14	49.071	4.480	.091	1.197	12	49.750	3.294	.066	.951
14.5	18	48.889	5.195	.106	1.224	10	49.000	5.235	.107	1.656
15.5	9	48.472	.....	.....	.....	22	49.636	4.782	.096	1.020
16.5	7	48.386	.....	.....	.....	9	47.396	.....	.....	.....
17.5	6	47.967	.....	.....	.....	4	44.950	.....	.....	.....
18.5	2	47.050	.....	.....	.....	....	.....	.....	.....	.....
19.5	2	49.950	.....	.....	.....	....	.....	.....	.....	.....
20.5	1	47.900	.....	.....	.....	....	.....	.....	.....	.....
Adult	4	50.220	.....	.....	.....	....	.....	.....	.....	.....

TABLE XXXIII. AGE CHANGES IN EAR INDEX, *continued*

NORTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	58.200	.....	.....	.....	3	58.300	.....	.....	.....
6.5	21	57.143	3.908	.068	.853	18	57.167	3.863	.068	.910
7.5	34	56.500	4.736	.084	.812	29	56.724	4.827	.085	.896
8.5	33	54.636	3.189	.058	.555	38	56.289	4.058	.072	.658
9.5	49	55.408	4.155	.075	.594	31	55.000	4.677	.085	.840
10.5	49	54.061	4.812	.089	.687	28	54.357	5.266	.097	.995
11.5	40	54.050	5.025	.093	.794	21	53.952	3.860	.072	.842
12.5	33	53.788	4.663	.087	.812	41	53.902	4.705	.087	.735
13.5	37	54.324	3.863	.071	.635	41	53.488	3.637	.068	.568
14.5	38	56.289	4.914	.087	.797	49	54.184	3.767	.070	.538
15.5	38	54.395	3.544	.065	.575	42	54.643	4.760	.087	.734
16.5	23	54.087	3.821	.071	.801	33	55.000	4.362	.079	.759
17.5	17	51.765	4.278	.083	1.038	26	53.462	4.733	.089	.928
18.5	4	58.175	.....	.....	.....	13	53.615	5.582	.104	1.548
19.5	6	53.167	.....	.....	.....	4	55.000	.....	.....	.....
20.5	4	56.775	.....	.....	.....	1	54.900	.....	.....	.....
Adult	3	54.700	.....	.....	.....	12	51.667	5.497	.106	1.554

SOUTH EUROPEAN

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	....	.....	.....	.....	.....	1	56.900	.....	.....	.....
6.5	30	57.067	5.247	.092	.958	28	57.929	4.581	.079	.866
7.5	52	57.173	4.568	.080	.633	50	56.980	5.324	.093	.753
8.5	37	55.649	6.707	.121	1.103	53	57.057	4.803	.084	.660
9.5	43	56.302	3.586	.064	.547	56	55.893	4.651	.083	.622
10.5	47	55.191	4.165	.075	.607	51	55.843	4.881	.087	.684
11.5	54	55.111	4.007	.073	.545	54	54.815	5.568	.102	.758
12.5	55	55.782	4.491	.081	.606	64	55.672	4.284	.077	.536
13.5	43	55.000	4.182	.076	.638	60	54.250	3.948	.073	.510
14.5	35	55.200	5.013	.091	.847	55	54.182	5.131	.095	.692
15.5	19	53.737	4.655	.087	1.068	40	53.625	4.066	.076	.643
16.5	12	53.417	4.232	.079	1.222	29	53.103	4.513	.085	.838
17.5	7	53.286	.....	.....	.....	24	52.375	5.543	.106	1.131
18.5	4	49.300	.....	.....	.....	8	53.261	.....	.....	.....
19.5	2	51.650	.....	.....	.....	8	50.350	.....	.....	.....
20.5	1	57.900	.....	.....	.....	4	58.325	.....	.....	.....
Adult	2	54.850	.....	.....	.....	2	59.650	.....	.....	.....

HAWAIIAN-ASIATIC

	MALE					FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	2	61.000	.....	.....	.....	1	58.900	.....	.....	.....
6.5	23	57.261	4.474	.078	.932	13	56.846	3.800	.067	1.054
7.5	34	55.500	4.493	.081	.770	33	56.061	3.930	.070	.684
8.5	36	56.056	4.352	.078	.725	38	55.500	3.640	.066	.591
9.5	32	56.031	4.246	.076	.750	42	56.048	3.612	.064	.557
10.5	39	55.462	3.672	.066	.587	37	53.595	5.211	.097	.857
11.5	26	55.539	3.915	.070	.767	25	54.760	4.465	.082	.893
12.5	24	55.042	3.964	.072	.809	33	52.485	4.214	.080	.734
13.5	24	52.333	3.286	.063	.670	33	53.121	4.183	.079	.728
14.5	27	53.889	3.872	.072	.745	28	51.607	3.848	.075	.727
15.5	17	51.529	4.459	.087	1.081	21	53.333	4.379	.082	.956
16.5	8	51.610	.....	.....	.....	30	53.033	3.647	.069	.666
17.5	7	50.600	.....	.....	.....	14	49.500	4.221	.086	1.128
18.5	8	50.900	.....	.....	.....	15	52.733	5.591	.106	1.443
19.5	8	50.870	.....	.....	.....	8	55.080	.....	.....	.....
Adult	32	50.781	4.159	.081	.735	30	51.933	4.697	.090	.857

TABLE XXXIII. AGE CHANGES IN EAR INDEX, *continued*

HAWAIIAN-NORTH EUROPEAN

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	62.500	.....	.....	.....	2	49.600	.....	.....	.....
6.5	25	58.720	3.985	.068	.797	20	56.450	3.354	.059	.750
7.5	33	56.000	4.768	.085	.830	36	56.222	4.124	.073	.687
8.5	47	54.915	4.151	.076	.605	38	56.974	4.133	.073	.671
9.5	36	55.361	3.506	.063	.584	47	56.660	5.696	.100	.831
10.5	45	55.378	4.533	.082	.676	47	54.213	4.227	.078	.616
11.5	57	54.193	4.157	.077	.550	54	53.704	5.126	.095	.698
12.5	47	53.659	3.686	.069	.538	35	55.657	4.112	.074	.695
13.5	41	54.000	3.975	.074	.621	57	53.351	4.633	.087	.618
14.5	14	53.100	3.590	.068	.568	50	53.260	4.199	.079	.594
15.5	31	53.484	4.035	.075	.725	53	52.547	5.127	.098	.704
16.5	31	52.097	3.872	.074	.695	38	52.947	4.078	.077	.662
17.5	19	52.474	4.511	.086	1.035	36	52.806	3.282	.062	.547
18.5	18	52.000	2.161	.042	.509	24	53.417	4.320	.081	.882
19.5	13	52.231	2.577	.049	.715	13	57.000	6.064	.106	1.682
Adult	70	52.143	4.357	.084	.521	78	51.911	5.030	.097	.570

HAWAIIAN-SOUTH EUROPEAN

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
5.5	1	62.000	.....	.....	.....	....	.....	.....	.....	.....
6.5	8	57.062	.....	.....	.....	4	56.770	.....	.....	.....
7.5	12	57.917	6.198	.107	1.789	13	55.154	2.931	.053	.812
8.5	19	54.737	4.865	.089	1.116	10	55.400	3.262	.059	1.031
9.5	21	54.476	3.850	.071	.840	16	56.500	3.606	.064	.902
10.5	16	56.750	4.024	.071	1.006	13	55.385	4.481	.081	1.242
11.5	21	53.667	4.051	.075	.884	18	54.167	3.236	.060	.763
12.5	12	54.334	5.071	.093	1.463	14	54.857	5.208	.095	1.391
13.5	18	53.833	4.512	.084	1.063	21	53.238	3.975	.075	.867
14.5	7	51.720	.....	.....	.....	17	53.059	4.868	.092	1.181
15.5	12	52.333	3.250	.062	.938	12	52.333	5.154	.098	1.487
16.5	5	52.000	.....	.....	.....	15	50.533	3.811	.075	.984
17.5	3	52.600	.....	.....	.....	9	53.255	.....	.....	.....
18.5	5	56.460	.....	.....	.....	9	51.700	.....	.....	.....
Adult	19	53.158	4.307	.081	.988	....	.....	.....	.....	.....

HAWAIIAN-ASIATIC-EUROPEAN

MALE						FEMALE				
Age	No.	A.	Sd.	V.	Em.	No.	A.	Sd.	V.	Em.
6.5	3	57.100	.....	.....	.....	3	54.230	.....	.....	.....
7.5	13	54.538	3.795	.070	1.052	16	55.063	2.726	.050	.682
8.5	14	56.143	3.961	.071	1.058	10	55.200	4.190	.076	1.325
9.5	11	56.909	2.938	.052	.885	9	53.489	.....	.....	.....
10.5	12	53.500	2.902	.054	.838	15	55.400	4.192	.076	1.082
11.5	11	53.455	4.142	.077	1.248	12	52.750	2.349	.045	.678
12.5	11	54.091	3.655	.068	1.102	12	52.250	3.345	.064	.966
13.5	11	52.091	4.337	.082	1.307	10	50.800	3.682	.072	1.164
14.5	12	51.750	3.767	.073	1.087	14	50.142	3.943	.079	1.054
15.5	4	51.125	.....	.....	.....	16	52.063	3.750	.072	.938
16.5	9	52.700	.....	.....	.....	10	52.800	4.190	.079	1.325
17.5	4	52.400	.....	.....	.....	10	52.800	4.996	.095	1.580
18.5	1	51.800	.....	.....	.....	2	55.900	.....	.....	.....
19.5	1	67.900	.....	.....	.....	3	55.033	.....	.....	.....
20.5	1	41.700	.....	.....	.....	1	58.100	.....	.....	.....
Adult	....	.....	.....	.....	.....	4	52.120	.....	.....	.....

QUALITATIVE CHARACTERS

At the inception of these investigations Dr. Sullivan chose to give special attention to what may be conveniently comprehended under the term qualitative characters. In most somatic studies of peoples the emphasis is placed upon measurements in units of length and breadth, perhaps because the character of the procedure and the objectivity of the units chosen give a feeling of precision, whereas attempts to classify by the form of hair, shape of the eyelids, etc., appear as subjective, and so uncertain. Usually the result has been to relegate these qualitative observations to the incidental column and to base conclusions on measurements of size, to the neglect of the important qualitative characters. Studies on the growth of children have also proceeded upon the assumption that the only significant characters were those of size, little attention being given to hair, eyes, ears, teeth, etc. It was to establish a balance between these two approaches to the somatic problems that Dr. Sullivan planned to give special attention to the recording of such characters. He recognized that when standards are set up, qualitative judgments can be made with precision, and the personal equation reduced to a minimum. In fact, he welcomed extensive field-work in Hawaii as an opportunity to experiment with these so-called qualitative characters, and later, while residing in Arizona because of impaired health, developed a more refined plan for the study of tooth, eye, and nose characters among the American Indians, to be followed by a study of negroes, and finally, a survey of immigrant groups in the white population. The Indian section of the program was carried well on toward completion before Dr. Sullivan's fatal illness and the greater part of the data compiled under his direction.

It has seemed best, then, to publish the data compiled, and since, unfortunately, Dr. Sullivan left no usable manuscript embodying his experience with these characters, to attempt no more than a descriptive statement of the comparative relations observed with respect to these characters and the gross age changes noted.

The literature for growth of qualitative characters is not voluminous and what there is, relates to European, or white, children. Chief attention has been given to hair, eyes, and nose. The most important titles have been reviewed by Martin (21) and need not be cited in the following pages.

HAIR FORM

In hair form the Hawaiians excel in wavy hair, but not in curly and frizzly, in which the South Europeans lead. With regard to straight hair the Koreans, Japanese, and Chinese are on one level; next in descending order are North Europeans, South Europeans, and finally, Hawaiians. The small group differences in straight hair make a genetic rating of the mixed groups difficult, the tendency, however, is for intermediate positions.

Age differences in hair form are evident in Table XXXV, the most striking being that straight hair decreases in frequency in all groups. Conversely, in observing the tables for low waves, for example, it will be seen that the frequencies increase with age, as:

	7-8 Years		15-16 Years	
	Male	Female	Male	Female
Hawaiian	.07	.18	.25	.28
Chinese	.00	.00	.02	.05
Japanese	.00	.00	.01	.03
Korean	.00	.00	.00	.05
North European	.03	.06	.08	.14
South European	.03	.06	.14	.29

Even for the straight-haired Chinese and Japanese, the exceptions occur in later life.

The Hawaiian crosses, treated in the same way, show age changes, as:

	7-8 Years		15-16 Years	
	Male	Female	Male	Female
Hawaiian-Asiatic	.00	.07	.21	.07
Hawaiian-North European	.03	.13	.22	.24
Hawaiian-South European	.00	.21	.24	.36
Hawaiian-Asiatic-Eur.	.00	.10	.17	.08

HAIR COLOR

A great deal of attention has been given to the color of hair, so little is needed in the way of comment upon Table XXXVII. Age changes may be noted, as, for example, the blond in the North European group decreases with age. Black hair increases with age among Hawaiians and South Europeans; the changes are less marked among the Chinese, Japanese, and Koreans, but with them there seems to be a slight decrease in black hair, and a consequent increase in dark brown. For the South Europeans, dark brown tends to decline, but to increase among North Europeans. In general, the tendency

among Hawaiians and Europeans is for the hair to darken with age, to pass over from blond and light brown to black, in terms of relative frequency. On the other hand, a slight tendency for black hair to give way to brown appears among the Chinese, Japanese, and Koreans.

In the Hawaiian crosses, black hair tends to increase with age throughout, while light and dark brown decrease. At six years of age the Hawaiian-Asiatic has about an even chance between black and brown hair, but by fifteen years the ratio is about 75 per cent black, 15 per cent brown. For North European crosses, at the same ages, the chances for black hair are about 20 per cent and 40 per cent respectively.

HAIR TEXTURE

Growth in hair texture is marked throughout. If attention is fixed upon coarse hair and graphs are drawn off for comparison, it appears that with all the pure groups, hair grows coarser with age, regardless of sex. Judged by the gradations of hair given, six to seven year old boys of Hawaiian, Korean, Chinese, and Japanese stocks, greatly exceed the girls in coarseness, but the two sexes draw closer together with age, the girls appearing to lead at fifteen to seventeen years. The North European group shows little coarse hair; the South European group is heterogeneous, but shows an appreciable amount of coarse hair.

A gross comparison of the mixed groups shows the age differences to be less regular than for the standard groups; yet the increase of coarse hair with age is even more marked, probably because the European crosses show a greater percentage of fine hair over the Hawaiians and Asiatics. Fine hair in early childhood is the outstanding characteristic of the North European standard group, but it makes relatively little impression upon the crosses, possibly because it is an infantile character rather than one of adult life.

The Chinese and Japanese lead in coarseness of hair texture, being closely similar; the Hawaiians and the Koreans are somewhat lower in the scale, but paired, and lowest of all are the Europeans.

EYE COLOR

So much attention has been given to the color of the eye that little comment is needed. Blue eyes are rare in the South European group and show a frequency of under 40 per cent for the North European group. Gray eyes are rare indeed, but in combination with brown approach a 10 per cent frequency among North Europeans; blue-brown eyes approach 15 per cent.

Dark brown is the prevailing color among the Asiatics, the frequency being fairly constant; the Hawaiians slightly exceed the Asiatics in this respect.

The tradition in anthropology is that eyes darken with age; but the Asiatics do not conform to this rule. The number of black eyes decreases and the number of light brown eyes increases with age. The relation is clearly seen in the Japanese, Chinese, and Korean tables, where the frequency for dark brown tends to be constant, whereas black eyes disappear and light brown increase in number.

Hawaiians and Europeans present a more confused seriation, but a close study of the tables indicates a tendency in the reverse direction. The frequency of black eyes among Hawaiian and South European children increases with age. No black eyes appear in the records for the North European group, blue is the color with the greatest frequency, which apparently remains constant with age; the frequency for brown eyes, however, tends to decline with age.

For the Hawaiian crosses, a decline in the frequency of black eyes is noticeable in Hawaiian-Asiatics and is accompanied by a corresponding increase in light brown. In the Hawaiian-South Europeans, the tendency is the reverse. The North European cross is complicated by the great range from Hawaiian black to European gray-brown, the browns remaining approximately constant age for age. In general, while the crosses, as compared with the parental groups, show the usual average intermediate position, every European pigment class is represented in the corresponding crosses, suggesting segregation.

EPICANTHIC FOLD

Table XLIII indicates that no group can count the epicanthic fold 100 per cent present, though this is approximated by the Koreans, Japanese, and Chinese. On the other hand, judged by the frequency of a "marked fold" alone, the Koreans are far in the lead; the Japanese slightly exceed the Chinese, but both show a much lower frequency than the Koreans.

The Hawaiians are credited with a 50 per cent presence of fold, but with a small number of cases with a marked fold. The two European

groups are opposed to the Chinese and Japanese in the all but 100 per cent absence of the fold. There is a slight difference between the two white groups, though perhaps less than that between the Chinese and Japanese, the South European group showing more folds. Thus, the Hawaiians stand midway between the Asiatics and the Europeans.

Age changes in the frequency of the fold are suggested in these tables. With the Japanese and Chinese the percentages in the column, "trace," tend to rise after fifteen years. Thus, while about 100 per cent of all children show the presence of the fold, there is a perceptible shift to a less marked fold in the adult. In the Hawaiian group, the tendency toward a vanishing of the fold is more evident, appearing also in their crosses.

In a later study Sullivan examined a number of full-blood Indian children (western United States), the gross results are as follows:

Age	Male No.	Female %	Male No.	Female %
5	3	100	6	100
6	13	100	10	100
7	20	87	22	82
8	25	86	30	80
9	38	84	30	81
10	66	86	80	86
11	76	84	69	79
12	100	81	76	75
13	90	78	93	78
14	95	72	93	68
15	92	72	91	73
16	80	62	111	79
17	73	57	85	67
18	89	62	50	65
19	54	58	28	64
Adult	45	38	23	77

The fact of change with age is not new (21, pp. 425-26; 10, p. 90), having been observed in white Europeans and in Africans. The data for European children indicate the fold to have a relatively high frequency at birth, but its occurrence is rare after the twelfth year. If this is a true statement, the slight tendencies in Sullivan's data are significant, and, on the whole, the long standing assumption that the fold is an infantile character, is justified. The relative positions of the mixed groups are apparently as follows:

EPICANTHIC FOLD PRESENT

	Children %	Adults %
Chinese	99	100
Hawaiian-Asiatic	90	70
Hawaiian	50	20
North European	3	0
South European	5	0
Hawaiian-North European	24	6
Hawaiian-South European	25	10

The children run lower than the adults, as previously noted, and in the crossed groups, tend to take intermediate positions, presenting quite regular ratios.

SCLERA

Differences in the pigmentation of the sclera have been noted by previous investigators. Sullivan gave this character careful attention and found it feasible to record the sclera as "clear" and "unclear." [4] The frequencies for "clear" are shown in the tables. As with many other characters, race relationships are suggested, as the close agreement of the Chinese, Japanese, and Koreans in frequency ratings; again, the two European groups approximate 100 per cent frequencies in contrast to the very low frequency of Hawaiians. In his earlier publications, Sullivan rated the adult Marquesans at 10 and 31 per cent, male and female, respectively, the Samoans at 23 and 45 per cent, and the Tongans at 18 and 42 per cent. It seems then that the Polynesians may be distinguished by a low percentage of frequency for a clear sclera.

Some age differences may be observed, but the North European children are "clear" throughout, while the slight frequencies for the "unclear," in the South European group, show some increase with age. Further, the Asiatics show a decisive decline in "clear" ratings with age, or, one may say that the pigmentation of the sclera increases with age. In the Hawaiian group there is no perceptible change; however, it may be that an increase of density of pigment with age would be indicated, if a degree rating were given to the "unclear."

The Hawaiian crosses offer opportunity to observe the inheritance of this character. The gross result for the age groups suggests the frequencies for ratings of "clear," as approximately:

	Per cent
Hawaiian-Asiatic	50
Hawaiian-South European	50
Hawaiian-North European	75
Hawaiian-Asiatic-European	50

In age changes, increase of pigmentation is observable for Hawaiian-Asiatic and Hawaiian-North European, but is not certain in the other groups.

[4] Actually, however, Sullivan attempted a more refined classification, using the following criteria: clear, speckled, yellow, dull, and bloodshot. When the tabulations were made this classification was reduced to clear and unclear.

NASAL PROFILE

It will be noted that in early childhood few noses are classed as convex; in fact, the greater number are rated as concave. As the adult level is reached, the concave type stands lowest in rating. Perhaps another way of stating the case would be to say that in infancy the nose is without a bridge, the chief characteristic of nose growth being the development of the bridge. In a previous publication, Sullivan presented data suggesting that the nose of the European grows forward, thus narrowing (relatively) the transverse diameter and increasing the antero-posterior rating for the nostril axis (44, p. 408): "At birth, in all races, the transverse diameter of the bridge is much greater than the antero-posterior diameter. As growth continues in the Caucasian groups these diameters tend to become equal. The greatest amount of growth is in a forward (antero-posterior) direction."

NOSE BRIDGE

Sullivan also rated the bridge of the nose as high, medium, and low. Table XLIX shows marked growth, as should be expected, since this rating was based upon a close examination of nasal bone development. Growth is from low to high in bridge, though the ratings for South Europeans present the one exception. Again, age changes are less marked with the North Europeans than with the Asiatics and Hawaiians. Of all the groups, the Hawaiians show the greatest growth in nose bridge, which is strongly reflected in their crosses; in fact, the crosses show an exuberance of growth in the frequency of high bridges (op. cit., pp. 406-409).

SEPTUM

As to the septum of the nose, the Koreans carry a high rating for "level," but Chinese, Japanese, Hawaiians, and North Europeans are approximately at the same level in a lower rating, and the South Europeans are still lower. In the crosses, the tendency is to rise above the ratings for the parental stocks. In the Chinese and Japanese, the larger groups, no certain difference because of age appears, though there is a suggested slight increase of frequencies with age.

The septum was also rated as wide, medium, narrow. In Table LI slight race differences can be noted. There is a tendency for the rating "wide" to fall rapidly after the sixth year, and, as may then be expected, a slight increase in the rating for medium.

It is not positively known what standard of comparison was used by the recorder, whether relative width or an absolute standard, but that the judgments were consistent is shown here, as elsewhere, by the close correspondence of the sexes within the respective groups.

AXIS OF NOSTRILS

One striking characteristic of the European nose is the forward direction of the long axis of the nostrils. This character is most accentuated in northern Europe. The data for children (North European) indicate an increase in frequency with age, oblique nostrils declining from 30 per cent at six years to zero at twenty. As is a matter of universal remark, the infant nose is flat.

The South European group presents a flatter nose, 50 per cent of the younger children showing antero-posterior axes. Though growth is not marked, there is a slight rise in this percentage with age.

The antero-posterior frequency is lower among Asiatics and Polynesians. In the data for children, the Chinese are markedly lower than the Japanese and the Koreans. On the other hand, the oblique nostril leads with Asiatics in early life, being more emphasized among Japanese and Koreans. In growth, the Japanese, for example, show a constant frequency for the transverse, whereas the antero-posterior rises while the oblique falls. Hence, the growth of the Japanese nose is toward the European type. The same is noticeable among the Koreans and to a lesser degree among the Chinese.

The Hawaiian nose in childhood is a trifle less flat than the Chinese. The frequencies for the oblique and the transverse are about the same, a slight growth change toward the oblique and the antero-posterior being noticeable.

In general, then, growth for all these racial groups is from the transverse toward the opposite diameter.

While in the Hawaiian-Asiatic, age changes are not evident, such changes are suggested with Hawaiian-European crosses, the frequency of the oblique, declining with age, in favor of the antero-posterior.

SLOPE OF THE FOREHEAD

In recording these observations low foreheads were noted so infrequently as to permit their

omission in the tables. The ratings for vertical forehead are high throughout, and generally higher for the male. The North European and the Korean rank high and the South European lowest, but the differences are too small to have much certainty. Growth is slight, but proceeds from vertical to moderate in slope, suggesting that a vertical forehead is the infantile form.

GLABELLA

The race groups are near the same rank in respect to smoothness. Slight shifts to medium occur after thirteen to fourteen years, indicating some growth in prominence. There is a small sex difference, the females leading in smoothness.

LIPS

For a long time the form and thickness of lips have been regarded as an important character. In previous papers, Sullivan notes for "thick":

	Male	Female
Marquesan	26.5	24.3
Samoan	7.1	4.3
Tongan	6.0	2.1
Hawaiian adults	1.0	1.0
Hawaiian children	13.0	6.0

If all these observations are of equal weight, there are striking differences. The Asiatics and the Europeans in Sullivan's groups are quite free from "thick" lips and the Hawaiian crosses take intermediate positions. Thin lips are rarely recorded for Hawaiians, most of them are rated as medium.

Age changes are clearly shown. The columns for "medium" show an increasing frequency with age. Thin lips rapidly decline in frequency to about the fifteenth year in Chinese, Japanese, and Koreans, which is, relatively speaking, the vanishing point, adults being over 90 per cent medium. With Hawaiians the situation is not so clear; the differences between the adults and the children suggest marked age changes in adult life, while on the other hand the seriations for children do not show clear tendencies in growth. If males alone are regarded, then there seems a shift from medium to thick, but the data for females are more irregular. Among South Europeans, thin lips change to medium; among North Europeans this change is less noticeable.

In general, then, lips grow thicker with age, the maturing point being about fourteen to fifteen years. Sex differences are not evident.

In the crosses, there are no marked deviations from an intermediate position.

PROGNATHISM

Prognathism was graded as none, slight, medium, marked. The summary shows that European children were about 100 per cent in the rating "none," so it may be said that they are sharply distinguished from the other groups. On the other hand, there is nothing like 100 per cent prognathism, the highest rating being 47 per cent (males) for the Hawaiians. The descending order of rating is Hawaiian, Chinese, Japanese, Korean. The rank for females is: Chinese, Japanese, Hawaiian, Korean. The only shift is with the Hawaiians.

The crosses take the usual intermediate position, as prognathous.

MALES

	Per cent		Per cent		Per cent
North European	2	Hawaiian Crosses	18	Hawaiian	47
South European	7	"	30	"	47
Chinese	43	"	41	"	47

FEMALES

	Per cent		Per cent		Per cent
North European	3	Hawaiian Crosses	12	Hawaiian	29
South European	7	"	22	"	29
Chinese	40	"	35	"	29

Changes with age are not observable among European children. In the other groups and the Hawaiian crosses, there is a slight decrease in the total prognathous ratings, suggesting that growth is toward a vanishing prognathism. The other general feature is a tendency for the prognathous rating to increase during the period from six to twelve years and to decrease thereafter. This is particularly marked among the Chinese and the Koreans.

CHIN

Observations were made upon the chin and checked as prominent, medium, receding. The tabulations present an erratic appearance, but some contrasts are noticeable. No marked sex differences are observable. Based upon the frequencies for receding chins, the Japanese and Chinese are in the lead, followed by the Hawaiians and Koreans. On the other hand, the Europeans are characterized by a very low frequency for the receding chin, with the North Europeans as the lowest. One could consistently place the Europeans in one contrast group as opposed to the Asiatics and the Hawaiians.

Age changes are not marked, but there is a suggestion of a shift from receding to medium, and from medium to prominent. One curious tendency is the greater frequency for prominent

chins at eleven to fourteen years, most marked among North Europeans. Since the two sexes are consistent in this respect, the result cannot be ignored as accidental.

In the crosses, since Hawaiian and Chinese are much alike in rating, it is consistent to find that the Hawaiian-Asiatic are not readily distinguishable from either parent group. The contrasts between Hawaiian and European are sharp, again the Hawaiian-European crosses taking an intermediate position.

ROLL OF THE HELIX

In a previous paper (41, p. 85) data are given on the roll of the helix and the method of observation stated. The frequencies for full-rolled ears are much higher for Hawaiians than for Samoans and Marquesans; since Sullivan made the observations in Hawaii and not the others, some allowance must be made for personal differences.

The difference between the respective groups in Table LXII are small. The Hawaiian ears are slightly less rolled than the others. The Koreans and North Europeans are about equally 100 per cent rolled, the South Europeans and Hawaiians clearly less, with the Chinese and Japanese as intermediate.

Age changes are equally obscure, though there is a slight suggestion of reduction in roll. Finally, there seems to be a sex difference in that the female ear is less rolled.

EAR LOBE

Observations on the lobe of the ear were recorded and a condensed summary is given in Table LXIII. The most striking differences in the racial groups of children appear when the presence and absence of the lobe is noted. Absence of the lobe is frequently recorded for Hawaiians. Some differences appear with respect to separate and attached lobes. Thus, Europeans constitute a group of high frequency for separate lobes, as opposed to the Chinese and Japanese. The Hawaiians are intermediate and the Koreans tend to fall in with the European.

In age changes, the rating "none" among Chinese and Japanese has a high frequency in early life, but vanishes to zero at about twelve to fourteen years. The small number of cases for Hawaiians renders their rating uncertain. In the rating "separate," no definite growth tendency is noted, the frequencies being constant in the long run.

DARWIN'S POINT

The frequency of Darwin's point was previously noted by Sullivan (41, 45, 46) as:

	Male %	Female %
Marquesans	4.0	0
Samoans	18.4	21.7
Tongans	21.5	5.2
Hawaiians	8.0	10.0

The Hawaiian rating as given in Table LXV has been added. No marked race differences are shown, nor does crossing seem to have much effect on the frequency. No age changes were observable.

CRURA

In the course of his observations, Sullivan marked the crura as high, medium, low. In Table LXVI some consistent group differences may be noted. Thus, the Chinese and the North European tend to be high, the Hawaiian medium, the Korean low.

Age changes are in evidence, the greatest frequency for a high crura occurring in early childhood.

SUMMARY

Several methods of summarizing the comparisons enumerated, readily suggest themselves. Table XXXIV arranges the racial groups in ascending order of rating for each character, from which the following grouping can be made:

	Male	Female
North European-South European	14	14
Chinese-Japanese-Korean	10	11
Chinese-Japanese	11	14
Japanese-Korean	12	8
Chinese-Korean	10	12
Korean-North European	4	2
Korean-South European	10	5
Chinese-North European	5	5
Chinese-South European	2	4
Japanese-North European	3	4
Japanese-South European	6	7
Hawaiian-Chinese	11	4
Hawaiian-Japanese	7	5
Hawaiian-Korean	5	11
Hawaiian-South European	7	7
Hawaiian-North European	4	2

This is a crude way of dealing with the data, but does have some reliability. The closest agreement is between North and South European groups, but the Asiatics are even nearer, as shown by the grouping of three races with a frequency almost equal to that of the two Europeans. The Hawaiians are somewhat apart, standing between the Europeans and the Asiatics, perhaps a little nearer to the Asiatics than to the Europeans. The close parallels between the sexes indicate a fair precision in these rankings.

TABLE XXXIV. SUMMARY OF RACE GROUPS IN RELATIVE RANK FOR EACH CHARACTER FREQUENCY. (THE RELATIVE LOWEST FREQUENCY IS 1, THE HIGHEST 6.)

	MALE						FEMALE					
	1	2	3	4	5	6	1	2	3	4	5	6
Coarse hair	N.E.	S.E.	H	K	C	J	N.E.	S.E.	K	C	J	H
Black hair	N.E.	S.E.	K	H	C=	J	N.E.	S.E.	K	H	J	C
Straight hair	H	S.E.	N.E.	K=	C=	J	H	S.E.	N.E.	K	J=	C
Brown eyes	N.E.	S.E.	K=	C	J	H	N.E.	S.E.	C	J	K	H
Marked fold	S.E.	N.E.	H	C	J	K	N.E.=	S.E.	H	C	J	K
Clear sclera	H	C	K	J	S.E.	N.E.	H	K	C	J	S.E.	N.E.
Straight nose profile	H	N.E.	C	K	S.E.	J	H	N.E.	C	K	S.E.	J
High nose bridge	K=	J	C	H	S.E.	N.E.	J	K	C	H	S.E.	N.E.
Oblique nostrils	N.E.	S.E.	H	C	K	J	N.E.	S.E.	H	C=	K	J
Wide septum	C	S.E.	J=	K	N.E.	H	K	C	S.E.	N.E.	J	H
Exposed septum	K	J	H	C	N.E.	S.E.	K	H	J	C	N.E.	S.E.
Vertical forehead	S.E.	H=	J	C	N.E.=	K	H	S.E.	J	C	K	N.E.
Thin lips	H	C=	J	K	N.E.	S.E.	H	K=	C	J=	N.E.	S.E.
No prognathism	H	C	J	K	S.E.	N.E.	C	J	H	K	S.E.	N.E.
Receding chin	N.E.	S.E.	K	H=	C	J	N.E.	S.E.	H	K	C=	J
Helix rolled, two-thirds	N.E.	S.E.=	C=	K=	H	J	N.E.	S.E.	C	J	K	H
No ear lobe	N.E.	S.E.	J	C	K	H	N.E.	J	S.E.	C	K	H
Darwin's point present	K	J=	S.E.	H	N.E.	C	H	S.E.	J	N.E.	C	K
High crura	H	K	S.E.	J	N.E.	C	H	K	S.E.	J	C	N.E.

TABLE XXXV. HAIR FORM

HAWAIIAN [a]

	Straight				Low Waves				Deep Waves				Curly				Frizzly				Totals	
	Male		Female		Male		Female		Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
																					9	5
	7	78	5	100	2	22	....	....	....	....	....	....	....	....	....	....	....	....	....	....	14	19
	13	93	15	79	1	7	4	21	....	....	....	....	....	....	....	....	....	....	....	....	20	32
	20	100	26	81	....	....	5	16	....	....	....	....	....	....	1	3	....	....	....	....	21	16
	19	91	14	88	2	9	1	6	....	....	....	....	....	....	1	6	....	....	....	....	36	31
	33	92	26	84	2	6	4	13	....	....	1	3	....	....	....	....	1	2	....	....	31	19
	23	74	16	84	3	10	3	16	2	6	....	....	2	6	....	....	1	3	....	....	28	28
	24	85	18	64	2	7	8	29	1	4	2	7	1	4	....	....	....	....	....	....	26	23
	21	81	20	87	3	11	3	13	2	8	....	....	....	....	....	....	....	....	....	....	30	30
	17	57	17	57	10	33	8	27	2	7	1	3	1	3	....	....	....	....	4	13	18	22
	10	56	12	55	5	28	8	36	2	11	1	5	1	5	....	....	....	....	1	5	13	15
	8	62	10	67	3	23	3	20	2	15	1	7	....	....	....	....	....	....	1	7	10	23
	7	70	18	78	1	10	3	13	2	20	1	4	....	....	....	....	....	....	1	4	7	11
	5	71	8	73	2	29	2	18	....	....	1	9	....	....	....	....	....	....	....	....	5	6
	3	60	3	50	2	40	1	17	....	....	2	33	....	....	....	....	....	....	....	....		
ls	210	78	208	74	38	14	53	19	13	5	10	4	5	2	2	1	2	1	7	2	268	280

woolly hair was recorded for this group.

CHINESE [a]

Age	Straight				Low Waves				Totals	
	Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	5	100	9	100	....	....	....	....	5	9
6.5	48	100	37	100	....	....	....	....	48	37
7.5	82	100	76	100	....	....	....	....	82	76
8.5	70	100	59	100	....	....	....	....	70	59
9.5	74	100	75	100	....	....	....	....	74	75
10.5	72	100	67	100	....	....	....	....	72	67
11.5	79	100	54	98	....	....	....	....	79	55[b]
12.5	57	100	67	100	....	....	....	....	57	67
13.5	65	98	55	100	1	2	....	....	66	55
14.5	66	98	69	100	1	2	....	....	67	69
15.5	49	100	56	100	....	....	....	....	49	56
16.5	44	98	41	95	1	2	2	5	45	43
17.5	35	100	39	100	....	....	....	....	35	39
18.5	29	97	14	100	1	3	....	....	30	14
19.5	10	100	8	100	....	....	....	....	10	8
Totals	785	99	726	99	4	1	2	1	789	729

[a] No deep waved, curly, or woolly hair was recorded.
[b] Includes 1 record of frizzly hair.

TABLE XXXV. HAIR FORM, *continued*

JAPANESE [a]

Age	Straight				Low Waves				Curly				Frizzly				Totals	
	Male		Female		Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	4	100	1	100	....	....	....	....	....	....	....	....	....	....	....	....	.....	1
6.5	4	100	4	100	....	....	....	....	....	....	....	....	....	....	....	....	73	58
7.5	7	100	5	100	....	....	....	....	....	....	....	....	....	....	....	....	104	118
8.5	6	100	4	100	....	....	....	....	....	....	....	....	....	....	....	....	110	96
9.5	7	88	9	100	....	....	....	....	....	....	....	....	....	....	....	....	97	96
10.5	13	100	6	100	....	....	....	....	....	....	....	....	....	....	....	....	100	103
11.5	13	100	10	100	....	....	1	1	....	....	....	....	....	....	....	....	81	85
12.5	15	100	6	100	....	....	1	1	....	....	....	....	....	....	....	....	103	90
13.5	14	100	12	100	....	....	2	2	....	....	....	....	....	....	1	1	102	91
14.5	17	100	10	91	....	....	....	....	....	....	....	....	....	....	....	....	123	73
15.5	9	100	22	100	....	....	1	2	....	....	....	....	....	....	1	2	105	65
16.5	7	100	8	89	1	1	1	4	....	....	....	....	1	1	....	....	88	29
17.5	6	100	4	100	1	2	....	....	1	2	....	....	....	....	....	....	60	18
18.5	2	100	....	....	1	3	1	8	....	....	....	....	1	3	....	....	38	13
19.5	2	100	....	....	....	....	....	....	....	....	....	....	....	....	....	....	15	4
Totals	1193	99	931	99	3	1	7	1	1	....	....	....	2	....	2	....	1199	940

[a] No record of deep waved or woolly hair was recorded.

KOREAN

Age	Straight				Low Waves				Totals	
	Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	No.
4.5	....	....	1	100	....	....	....	....	....	1
5.5	4	100	1	100	....	....	....	....	4	1
6.5	4	100	4	100	....	....	....	....	4	4
7.5	7	100	5	100	....	....	....	....	7	5
8.5	6	100	4	100	....	....	....	....	6	4
9.5	7	88	9	100	1	12	....	....	8	9
10.5	13	100	6	100	....	....	....	....	13	6
11.5	13	100	10	100	....	....	....	....	13	10
12.5	15	100	6	100	....	....	....	....	15	6
13.5	14	100	12	100	....	....	....	....	14	12
14.5	17	100	10	91	....	....	1	9	17	11
15.5	9	100	22	100	....	....	....	....	9	22
16.5	7	100	8	89	....	....	1	11	7	9
17.5	6	100	4	100	....	....	....	....	6	4
18.5	2	100	....	....	....	....	....	....	2	....
19.5	2	100	....	....	....	....	....	....	2	....
Totals	126	99	102	98	1	1	2	2	127	104

NORTH EUROPEAN [a]

Age	Straight				Low Waves				Deep Waves				Curly				Totals	
	Male		Female		Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	1	100	3	100	....	....	....	....	....	....	....	....	....	....	....	....	1	3
6.5	20	100	16	94	....	....	1	6	....	....	....	....	....	....	....	....	20	17
7.5	32	97	27	93	1	3	2	7	....	....	....	....	....	....	....	....	33	29
8.5	35	100	36	95	....	....	2	5	....	....	....	....	....	....	....	....	35	38
9.5	47	98	28	90	....	....	3	10	1	2	....	....	....	....	....	....	48	31
10.5	48	96	26	93	1	2	2	7	....	....	....	....	1	2	....	....	50	28
11.5	40	100	17	77	....	....	3	14	....	....	2	9	....	....	....	....	40	22
12.5	33	100	35	83	....	....	5	12	....	....	2	5	....	....	....	....	33	42
13.5	37	100	36	88	....	....	5	12	....	....	....	....	....	....	....	....	37	41
14.5	35	92	43	86	3	8	6	12	....	....	1	2	....	....	....	....	38	50
15.5	34	89	35	84	3	8	6	14	....	....	....	....	1	3	1	2	38	42
16.5	23	100	30	86	....	....	5	14	....	....	....	....	....	....	....	....	23	35
17.5	16	94	20	77	....	....	5	19	1	6	1	4	....	....	....	....	17	26
18.5	3	75	10	77	....	....	1	8	....	....	....	....	1	25	2	15	4	13
19.5	6	100	2	40	....	....	....	....	....	....	3	60	....	....	....	....	6	5
Totals	410	96	364	86	8	2	46	11	2	1	9	2	3	1	3	1	423	422

[a] No frizzly or woolly hair was recorded.

TABLE XXXV. HAIR FORM, *continued*

SOUTH EUROPEAN

Age	Straight				Low Waves				Deep Waves				Curly				Frizzly				Totals	
	Male		Female		Male		Female		Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	1	100	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
6.5	29	97	27	96	1	3	....	....	....	....	1	4	....	....	....	....	....	....	....	....	30	28
7.5	52	100	41	82	....	....	3	6	....	....	3	6	....	....	3	6	....	....	....	....	52	50
8.5	35	94	48	89	1	3	4	7	....	....	....	....	1	3	2	4	....	....	....	....	37	54
9.5	46	100	48	85	....	....	6	11	....	....	....	....	....	....	2	4	....	....	....	....	46	56
10.5	43	90	41	80	3	6	7	14	....	....	2	4	2	4	1	2	....	....	....	....	48	51
11.5	50	92	45	83	3	6	6	11	....	....	1	2	....	....	2	4	....	....	....	....	54[a]	54
12.5	47	87	51	79	1	2	6	9	1	2	1	2	4	7	5	8	....	....	1	2	54[a]	64
13.5	38	85	38	63	5	11	15	25	1	2	5	8	1	2	1	2	....	....	1	2	45	60
14.5	28	80	38	69	2	6	11	20	....	....	3	6	4	11	1	2	1	3	1	2	35	55[a]
15.5	14	74	23	58	2	11	10	25	1	5	4	10	1	5	3	7	1	5	....	....	19	40
16.5	9	75	21	72	2	17	7	24	1	8	1	4	....	....	....	....	....	....	....	....	12	29
17.5	3	43	13	52	3	43	8	32	1	14	2	8	....	....	1	4	....	....	1	4	7	25
18.5	1	25	8	100	1	25	....	....	1	25	....	....	....	....	....	....	....	....	....	....	4[a]	8
19.5	1	50	5	63	....	....	3	37	....	....	....	....	1	50	....	....	....	....	....	....	2	8
Totals	396	89	448	76	24	5	86	15	6	1	23	4	14	3	21	4	2	1	4	1	445[b]	583[c]

[a] Includes one record of woolly hair
[b] Includes three records of woolly hair
[c] Includes one record of woolly hair

TABLE XXXVI. COMPARISON OF HAIR FORM IN RACES

Group	Straight				Low Waves				Deep Waves				Curly				Frizzly				Woolly				Totals	
	Male		Female		Male		Female		Male		Female		Male		Female		Male		Female		Male		Female		Male	Female
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	n
Hawaiian	210	78	208	74	38	14	53	19	13	5	10	4	5	2	2	1	2	1	7	2	....	....	....	....	268	280
Chinese	785	99	726	99	4	1	2	1	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	789	729
Japanese	1193	99	931	99	3	1	1	1	....	....	....	....	1	....	....	....	2	....	2	....	....	....	....	....	1199	940
N. European	410	96	364	86	8	2	46	11	2	1	9	2	3	1	3	1	....	....	....	....	....	....	....	....	423	422
S. European	396	89	448	76	24	5	86	15	6	1	23	4	14	3	21	4	2	1	4	1	3	1	1	....	445	583
Korean	126	99	102	98	1	1	2	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	127	104
Haw.-Asiatic	295	93	334	89	16	5	27	7	7	2	7	2	....	....	3	1	....	....	4	1	....	....	....	....	318	375
Haw.-N. European	412	86	406	73	54	11	98	18	12	2	31	6	4	1	8	1	....	....	10	2	....	....	....	....	482	553
Haw.-S. European	129	79	105	61	14	9	42	24	12	7	10	6	7	4	4	2	1	1	9	5	....	....	3	2	163	173
Haw.-As.-Eur.	106	89	115	79	8	6	24	17	2	2	3	2	2	2	....	....	1	1	3	2	....	....	....	....	119	145

TABLE XXXVII. HAIR COLOR

HAWAIIAN

Age	Black				Dark Brown				Red Brown				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
6.5	6	67	....	....	3	33	5	100	....	....	....	....	9	5
7.5	11	79	9	50	3	21	9	50	....	....	....	....	14	18
8.5	10	50	14	44	10	50	15	47	....	....	3	9	20	32
9.5	12	57	10	63	9	43	5	31	....	....	1	6	21	16
10.5	25	69	15	49	11	31	14	45	....	....	2	6	36	31
11.5	21	68	15	79	9	29	4	21	1	3	....	....	31	19
12.5	17	61	15	56	11	39	12	44	....	....	....	....	28	27
13.5	18	69	17	74	8	31	5	22	....	....	1	4	26	23
14.5	19	63	21	70	11	37	6	20	....	....	3	10	30	30
15.5	14	78	20	91	4	22	2	9	....	....	....	....	18	22
16.5	9	69	12	80	3	23	3	20	1	8	....	....	13	15
17.5	7	70	20	87	3	30	3	13	....	....	....	....	10	23
18.5	7	100	9	82	....	....	2	18	....	....	....	....	7	11
19.5	4	80	6	100	1	20	....	....	....	....	....	....	5	6
Totals	180	67	183	65	86	32	85	31	2	1	10	4	268	278

CHINESE

Age	Black				Dark Brown				Totals	
	Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	5	100	8	89	....	....	1	11	5	9
6.5	44	92	34	92	4	8	3	8	48	37
7.5	78	95	58	76	4	5	18	24	82	76
8.5	64	91	51	85	6	9	8	15	70	59
9.5	71	96	65	87	3	4	10	13	74	75
10.5	62	86	61	91	10	14	6	9	72	67
11.5	73	92	47	86	6	8	8	14	79	55
12.5	50	88	62	93	6	11	5	7	57[a]	67
13.5	60	91	48	87	6	9	7	13	66	55
14.5	62	93	63	91	5	7	6	9	67	69
15.5	38	78	45	80	11	22	11	20	49	56
16.5	33	73	35	81	12	27	8	19	45	43
17.5	27	77	33	85	8	23	6	15	35	39
18.5	25	83	13	93	5	17	1	7	30	14
19.5	10	100	7	88	....	....	1	12	10	8
Totals	702	89	630	86	86	11	99	14	789	729

[a] This total includes one case of light brown hair

JAPANESE

Age	Black				Dark Brown				T
	Male		Female		Male		Female		Male
	No.	%	No.	%	No.	%	No.	%	No.
5.5	....	....	1	100	....	....	....	....	....
6.5	64	88	37	64	9	12	21	36	73
7.5	97	93	71	60	7	7	47	40	104
8.5	102	93	59	61	8	7	37	39	110
9.5	87	90	76	79	10	10	20	21	97
10.5	98	98	75	73	2	2	27	26	100[a]
11.5	72	89	72	85	9	11	13	15	81
12.5	93	90	80	89	9	9	10	11	103[b]
13.5	86	84	78	86	16	16	13	14	102
14.5	109	89	64	88	13	10	9	12	123[c]
15.5	88	84	55	85	17	16	10	15	105
16.5	81	92	25	86	7	8	4	14	88
17.5	45	75	14	78	15	25	4	22	60
18.5	30	79	11	85	8	21	2	15	38
19.5	11	73	4	100	4	27	....	....	15
Totals	1063	89	722	77	134	11	217	23	1199

[a] One case of red brown hair is included in this total.
[b] One case of light brown hair is included in this total.
[c] One case of light brown hair is included in this total.

KOREAN

Age	Black				Dark Brown				Totals	
	Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	1	25	....	....	3	75	1	100	4	1
6.5	....	....	2	50	4	100	2	50	4	4
7.5	6	86	3	60	1	14	2	40	7	5
8.5	2	33	4	100	4	67	....	....	6	4
9.5	3	37	4	44	5	63	5	56	8	9
10.5	2	15	2	33	11	85	4	67	13	6
11.5	8	62	2	20	5	38	8	80	13	10
12.5	4	27	1	17	11	73	5	83	15	6
13.5	7	50	5	42	7	50	7	58	14	12
14.5	5	29	5	46	12	71	6	54	17	11
15.5	4	44	17	77	5	56	5	23	9	22
16.5	2	29	6	67	5	71	3	33	7	9
17.5	4	67	3	75	2	33	1	25	6	4
18.5	1	50	....	....	1	50	....	....	2	....
19.5	2	100	....	....	....	....	....	....	2	....
Totals	50	40	54	52	77	60	49	48	127	103

TABLE XXXVII. HAIR COLOR, *continued*

NORTH EUROPEAN

Age	Dark Brown				Light Brown				Blond				Golden				Red				Totals	
	Male		Female		Male		Female		Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	----	----	1	33	1	100	2	67	----	----	----	----	----	----	----	----	----	----	----	----	1	3
6.5	2	10	3	18	11	52	6	35	7	33	8	47	1	5	----	----	----	----	----	----	21	17
7.5	6	18	4	14	15	46	12	43	10	30	7	25	1	3	4	14	----	----	1	4	33[a]	28
8.5	6	17	6	16	21	60	18	47	7	20	12	32	1	3	2	5	----	----	----	----	35	38
9.5	5	10	4	13	25	52	19	61	14	29	6	20	1	2	----	----	2	4	1	3	48[b]	31[b]
10.5	8	16	8	29	26	52	12	42	16	32	8	29	----	----	----	----	----	----	----	----	50	28
11.5	6	15	1	4	19	49	12	55	15	37	7	32	----	----	2	9	----	----	----	----	40	22
12.5	9	27	11	26	18	55	19	45	5	15	9	22	1	3	2	5	----	----	1	2	33	42
13.5	16	43	9	22	13	35	21	51	7	19	9	22	1	3	2	5	----	----	----	----	37	41
14.5	13	34	11	21	17	44	25	51	6	16	8	16	1	3	6	12	1	3	----	----	38	50
15.5	6	15	14	33	27	71	18	43	3	8	7	17	1	3	2	5	----	----	----	----	38[c]	42[c]
16.5	4	18	12	34	12	53	15	43	4	17	7	20	1	4	1	3	1	4	----	----	23[d]	35
17.5	5	29	5	19	12	71	14	54	----	----	2	8	----	----	2	8	----	----	3	11	17	26
18.5	1	25	7	54	3	75	5	39	----	----	----	----	----	----	1	8	----	----	----	----	4	13
19.5	2	33	3	60	3	50	1	20	1	17	----	----	----	----	----	----	----	----	1	20	6	5
Totals	89	21	99	23	223	52	199	47	95	22	90	21	9	2	24	6	4	1	7	2	424	421

[a] Total includes one case of black hair.
[b] Total includes one case of red brown hair.
[c] Total includes one case of red brown hair.
[d] Total includes one case of black hair.

SOUTH EUROPEAN [a]

Age	Black				Dark Brown				Reddish Brown				Light Brown				Blond				Golden				Totals	
	Male		Female		Male		Female		Male		Female		Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	----	----	----	----	----	----	----	----	----	----	----	----	----	----	1	100	----	----	----	----	----	----	----	----	----	1
6.5	2	8	----	----	13	43	18	67	----	----	----	----	13	43	8	29	1	3	1	4	1	3	----	----	30	27
7.5	3	6	4	8	30	57	19	38	----	----	----	----	17	33	23	46	2	4	3	6	----	----	1	2	52	50
8.5	7	19	5	9	24	65	36	67	----	----	1	2	6	16	10	18	----	----	1	2	----	----	1	2	37	54
9.5	5	11	4	7	30	65	31	56	----	----	1	2	10	22	17	30	----	----	3	5	1	2	----	----	46	56
10.5	4	8	3	6	34	71	32	63	----	----	----	----	10	21	15	29	----	----	1	2	----	----	----	----	48	51
11.5	9	17	7	13	31	57	35	65	----	----	----	----	13	24	7	13	1	2	5	9	----	----	----	----	54	54
12.5	11	20	8	12	34	63	44	69	----	----	----	----	8	15	12	19	1	2	----	----	----	----	----	----	54	64
13.5	13	30	13	21	31	70	36	60	----	----	1	2	----	----	10	17	----	----	----	----	----	----	----	----	44	60
14.5	9	26	15	27	20	57	35	64	----	----	----	----	5	14	5	9	1	3	----	----	----	----	----	----	35	55
15.5	6	32	9	23	7	36	21	53	----	----	1	2	6	32	8	20	----	----	1	2	----	----	----	----	19	40
16.5	2	17	4	13	10	83	17	58	----	----	1	4	----	----	5	17	----	----	1	4	----	----	1	4	12	29
17.5	2	29	8	32	5	71	13	52	----	----	1	4	----	----	3	12	----	----	----	----	----	----	----	----	7	25
18.5	3	75	2	25	----	----	5	63	----	----	----	----	1	25	1	12	----	----	----	----	----	----	----	----	4	8
19.5	----	----	3	38	2	100	4	50	----	----	1	12	----	----	----	----	----	----	----	----	----	----	----	----	2	8
Totals	76	17	85	15	271	61	346	59	----	----	7	1	89	20	125	21	6	1	16	3	2	1	3	1	444	582

[a] No examples of red hair were recorded for this group.

TABLE XXXVII. HAIR COLOR, *continued*

HAWAIIAN-ASIATIC

Age	Black				Dark Brown				Reddish Brown				Light Brown				Totals	
	Male		Female		Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	1	50	2	100	1	50	....	....	....	....	....	....	....	....	2	2
6.5	15	65	5	38	7	31	8	62	....	....	....	....	1	4	....	....	23	13
7.5	27	82	15	48	5	15	16	52	1	3	....	....	....	....	....	....	33	31
8.5	23	64	20	52	13	36	16	42	....	....	1	3	....	....	1	3	36	38
9.5	21	62	22	52	13	38	20	48	....	....	....	....	....	....	....	....	34	42
10.5	31	80	25	68	8	20	10	27	....	....	2	5	....	....	....	....	39	37
11.5	17	63	15	63	9	33	9	37	....	....	....	....	1	4	....	....	27	24
12.5	20	83	23	70	4	17	9	27	....	....	1	3	....	....	....	....	24	33
13.5	17	71	24	73	7	29	9	27	....	....	....	....	....	....	....	....	24	33
14.5	22	82	25	89	5	18	3	11	....	....	....	....	....	....	....	....	27	28
15.5	13	72	19	86	5	28	3	14	....	....	....	....	....	....	....	....	18	22
16.5	7	88	27	84	1	12	5	16	....	....	....	....	....	....	....	....	8	32
17.5	5	83	12	80	1	17	3	20	....	....	....	....	....	....	....	....	6	15
18.5	7	88	14	93	1	12	1	7	....	....	....	....	....	....	....	....	8	15
19.5	4	50	8	100	4	50	....	....	....	....	....	....	....	....	....	....	8	8
Totals	229	72	255	68	85	27	113	30	1	....	4	1	2	1	1	1	317	373

HAWAIIAN-NORTH EUROPEAN

Age	Black				Dark Brown				Reddish Brown				Light Brown				Blond				Total
	Male		Female		Male		Female		Male		Female		Male		Female		Male		Female		Male
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.
5.5	....	....	....	....	1	100	1	50	....	....	1	50	....	....	....	....	....	....	....	....	1
6.5	4	16	3	15	13	54	12	60	....	....	....	....	7	29	4	20	....	....	1	5	24
7.5	11	33	5	14	13	40	23	64	....	....	....	....	9	27	8	22	....	....	....	....	33
8.5	9	19	6	16	30	62	25	65	....	....	....	....	9	19	5	13	....	....	....	....	48
9.5	5	14	4	8	24	67	36	77	....	....	1	2	7	19	6	13	....	....	....	....	36
10.5	7	16	12	26	30	69	25	53	....	....	1	2	5	11	8	17	....	....	1	2	44[ba]
11.5	12	21	11	20	33	59	32	58	1	2	2	4	10	18	9	16	....	....	1	2	56
12.5	16	34	7	21	27	58	22	64	2	4	....	....	2	4	5	15	....	....	....	....	47
13.5	10	24	14	25	26	64	35	62	....	....	....	....	5	12	5	9	....	....	1	2	41
14.5	15	38	19	38	20	50	26	52	....	....	....	....	4	10	5	10	1	2	....	....	40
15.5	10	33	22	40	17	57	24	43	....	....	1	2	3	10	7	13	....	....	....	....	30
16.5	7	23	19	50	20	64	17	44	1	3	1	3	3	10	1	3	....	....	....	....	31
17.5	4	21	20	54	13	69	15	41	....	....	2	5	1	5	....	....	....	....	....	....	19[a]
18.5	8	44	7	29	9	50	14	58	....	....	....	....	1	6	3	13	....	....	....	....	18
19.5	7	54	6	46	6	46	5	39	....	....	....	....	....	....	2	15	....	....	....	....	13
Totals	125	26	155	28	282	59	312	57	4	1	9	2	66	14	68	12	1	....	4	1	481

[a] This total includes one case of red hair.
[b] This total includes one case of golden hair.

HAWAIIAN-SOUTH EUROPEAN [a]

Age	Black				Dark Brown				Reddish Brown				Light Brown				Totals	
	Male		Female		Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	....	....	....	....	....	....	....	....	....	....	1	100	....	....	1	....
6.5	4	50	1	25	4	50	3	75	....	....	....	....	....	....	....	....	8	4
7.5	2	17	3	23	9	75	9	69	....	....	....	....	1	8	1	8	12	13
8.5	7	33	1	10	12	57	8	80	....	....	....	....	2	10	1	10	21	10
9.5	9	43	4	27	11	52	10	66	....	....	....	....	1	5	1	7	21	15
10.5	4	25	4	31	10	63	9	69	....	....	....	....	1	6	....	....	16[b]	13
11.5	7	32	2	11	14	63	14	77	....	....	1	6	1	5	1	6	22	18
12.5	4	33	8	57	8	67	6	43	....	....	....	....	....	....	....	....	12	14
13.5	10	55	11	52	7	39	9	43	1	6	1	5	....	....	....	....	18	21
14.5	1	14	10	59	6	86	7	41	....	....	....	....	....	....	....	....	7	17
15.5	2	17	7	59	9	75	4	33	1	8	....	....	....	....	1	8	12	12
16.5	3	60	10	71	2	40	4	29	....	....	....	....	....	....	....	....	5	14
17.5	2	67	7	78	1	33	2	22	....	....	....	....	....	....	....	....	3	9
18.5	4	80	5	56	1	20	3	33	....	....	1	11	....	....	....	....	5	9
19.5	....	....	2	100	....	....	....	....	....	....	....	....	....	....	....	....	....	2
Totals	59	36	75	44	94	58	88	51	2	1	3	2	7	4	5	3	163	171

[a] No cases of golden or red hair were recorded for either sex group and no blond females.
[b] This total includes one case of blond hair.

TABLE XXXVII. HAIR COLOR, *continued*

HAWAIIAN-ASIATIC-EUROPEAN [a]

Age	Black				Dark Brown				Light Brown				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
6.5	1	33	1	33	1	33	1	33	1	33	1	33	3	3
7.5	6	46	8	50	7	54	7	44	....	....	1	6	13	16
8.5	7	50	2	20	7	50	8	80	....	....	....	....	14	10
9.5	4	36	2	22	5	46	7	78	2	18	....	....	11	9
10.5	4	31	5	33	7	54	9	60	2	15	....	....	13	15[b]
11.5	3	27	8	67	6	55	4	33	2	18	....	....	11	12
12.5	5	45	5	42	5	45	7	58	1	9	....	....	11	12
13.5	5	45	7	64	6	55	4	36	....	....	....	....	11	11
14.5	5	42	12	75	7	58	2	13	....	....	1	6	12	16[b]
15.5	4	100	10	59	....	....	6	35	....	....	1	6	4	17
16.5	5	50	8	89	5	50	1	11	....	....	....	....	10	9
17.5	2	50	5	50	2	50	5	50	....	....	....	....	4	10
18.5	....	....	1	50	1	100	1	50	....	....	....	....	1	2
19.5	1	100	1	33	....	....	1	67	....	....	....	....	1	3
Totals	52	44	75	52	58	48	64	44	8	6	4	3	119	145

[a] Blond, golden, and red hair did not appear in these Hawaiian-Asiatic-European mixtures, and among the males no case of reddish brown hair.

[b] Total includes one case of reddish brown hair.

TABLE XXXVIII. HAIR COLOR, COMPARISON OF RACES

Group	Black				Dark Brown				Reddish Brown				Light Brown				Blond				Golden				Red				Totals	
	Male		Female		Male		Female		Male		Female		Male		Female		Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
Hawaiian	180	67	183	65	86	32	85	31	2	1	10	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	268	278
Chinese	702	89	630	86	86	11	99	14	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	789	729
Japanese	1063	89	722	77	134	11	217	23	....	....	1	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1199	940
North European	2	1	....	....	89	21	99	23	2	1	2	1	223	52	199	47	95	22	90	21	9	2	24	6	4	1	7	2	424	421
South European	76	17	85	15	271	61	346	59	....	....	7	1	89	20	125	21	6	1	16	3	2	1	3	1	....	....	....	....	444	582
Korean	50	40	54	52	77	60	50	48	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	127	104
Haw.-Asiatic	229	72	255	68	85	27	113	30	1	....	4	1	2	1	1	1	....	....	....	....	....	....	....	....	....	....	....	....	317	373
Haw.-N. European	125	26	155	28	282	59	312	57	4	1	9	2	66	14	68	12	1	....	4	1	1	....	2	....	2	....	2	....	481	552
Haw.-S. European	59	36	75	44	94	58	88	51	2	1	3	2	7	4	5	3	1	1	....	....	....	....	....	....	....	....	....	....	163	171
Haw.-As.-Euro.	53	44	75	52	58	48	64	44	....	....	2	1	8	6	4	3	....	....	....	....	....	....	....	....	....	....	....	....	120	145

TABLE XXXIX. HAIR TEXTURE

HAWAIIAN

Age	Coarse				Medium				Totals	
	Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	No.
6.5	6	67	1	20	3	33	4	80	9	5
7.5	12	86	6	32	2	14	12	63	14	19[a]
8.5	12	60	11	34	8	40	21	66	20	32
9.5	11	52	7	47	10	48	8	53	21	15
10.5	27	79	21	68	7	21	10	32	34	31
11.5	25	81	14	78	6	19	3	17	31	18[a]
12.5	14	70	22	82	6	30	5	18	20	27
13.5	12	63	17	81	7	37	4	19	19	21
14.5	21	81	18	78	5	19	5	22	26	23
15.5	10	67	13	87	5	33	2	13	15	15
16.5	5	71	7	70	2	29	3	30	7	10
17.5	5	100	10	71	....	....	4	29	5	14
18.5	1	50	7	88	1	50	1	12	2	8
19.5	4	100	3	100	....	....	....	....	4	3
Totals	165	73	157	65	62	27	82	34	227	241

[a] Total includes one case of fine textured hair.

CHINESE

Age	Coarse				Medium				Totals	
	Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	5	100	3	33	....	....	6	67	5	9
6.5	38	79	10	27	10	21	27	73	48	37
7.5	72	88	21	28	9	11	55	72	82[a]	76
8.5	60	86	30	51	10	14	29	49	70	59
9.5	69	93	37	49	5	7	38	51	74	75
10.5	61	85	33	49	11	15	34	51	72	67
11.5	70	89	31	56	9	11	24	44	79	55
12.5	50	89	48	72	6	11	19	28	56	67
13.5	62	94	40	73	4	6	15	27	66	55
14.5	59	89	51	74	7	11	18	26	66	69
15.5	45	92	45	80	4	8	11	20	49	56
16.5	39	87	33	77	6	13	10	23	45	43
17.5	28	80	36	92	7	20	3	8	35	39
18.5	26	87	11	79	4	13	3	21	30	14
19.5	9	90	6	86	1	10	1	14	10	7
Totals	693	88	435	60	93	12	293	40	787	728

[a] Total includes one case of fine textured hair.

JAPANESE

Age	Coarse				Medium				Fine				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	....	....	....	....	1	100	....	....	....	....	....	1
6.5	52	71	12	21	20	27	44	75	1	1	2	3	73	58
7.5	95	91	35	29	9	9	82	70	....	....	1	1	104	118
8.5	93	85	45	47	17	15	50	52	....	....	1	1	110	96
9.5	87	90	47	49	10	10	49	51	....	....	....	....	97	96
10.5	90	91	62	60	9	9	41	40	....	....	....	....	99	103
11.5	72	89	68	80	9	11	17	20	....	....	....	....	81	85
12.5	90	87	74	82	12	12	16	18	1	1	....	....	103	90
13.5	87	86	78	86	14	14	13	14	....	....	....	....	101	91
14.5	112	91	62	85	11	9	11	15	....	....	....	....	123	73
15.5	95	91	58	92	10	9	5	8	....	....	....	....	105	63
16.5	80	92	27	93	7	8	2	7	....	....	....	....	87	29
17.5	50	83	16	89	10	17	2	11	....	....	....	....	60	18
18.5	32	84	13	100	6	16	....	....	....	....	....	....	38	13
19.5	8	57	3	75	6	43	1	25	....	....	....	....	14	4
Totals	1043	87	600	63	150	13	334	36	2	....	4	1	1195	938

TABLE XXXIX. HAIR TEXTURE, *continued*

KOREAN

Age	Coarse				Medium				Totals	
	Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	2	50	....	....	2	50	2	100	4	2
6.5	....	....	1	25	4	100	3	75	4	4
7.5	5	71	3	60	2	29	2	40	7	5
8.5	5	83	1	25	1	17	3	75	6	4
9.5	6	75	2	22	2	25	7	78	8	9
10.5	10	77	2	33	3	23	4	67	13	6
11.5	10	77	4	40	3	23	6	60	13	10
12.5	9	60	3	50	6	40	3	50	15	6
13.5	13	93	8	67	1	7	4	33	14	12
14.5	13	77	6	55	4	23	5	45	17	11
15.5	7	78	17	77	2	22	5	23	9	22
16.5	6	86	7	78	1	14	2	22	7	9
17.5	5	83	4	100	1	17	....	....	6	4
18.5	1	50	....	....	1	50	....	....	2	....
19.5	2	100	....	....	....	....	....	....	2	....
Totals	94	74	58	56	33	26	46	44	127	104

NORTH EUROPEAN

Age	Coarse				Medium				Fine				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	....	....	....	....	1	33	1	100	2	67	1	3
6.5	....	....	....	....	7	35	7	39	13	20	11	61	20	18
7.5	1	3	....	....	11	33	6	21	21	64	23	79	33	29
8.5	....	....	2	5	12	35	13	34	22	65	23	61	34	38
9.5	3	6	....	....	19	41	16	51	25	53	15	49	47	31
10.5	1	2	....	....	24	48	13	46	25	50	15	54	50	28
11.5	....	....	1	5	25	63	12	54	15	37	9	41	40	22
12.5	....	....	....	....	22	67	28	67	11	33	14	33	33	42
13.5	....	....	....	....	26	70	31	76	11	30	10	24	37	41
14.5	1	3	....	....	30	79	33	66	7	18	17	34	38	50
15.5	....	....	....	....	33	87	32	78	5	13	9	22	38	41
16.5	....	....	1	3	22	96	27	77	1	4	7	20	23	35
17.5	....	....	....	....	17	100	22	85	....	....	4	15	17	26
18.5	....	....	....	....	4	100	13	100	....	....	....	....	4	13
19.5	1	17	1	20	5	83	4	80	....	....	....	....	6	5
Totals	7	2	5	1	257	61	258	61	157	37	159	38	421	422

SOUTH EUROPEAN

Age	Coarse				Medium				Fine				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	....	....	....	....	....	....	....	....	1	100	....	1
6.5	6	22	1	4	18	64	21	78	4	14	5	18	28	27
7.5	7	14	7	14	35	67	27	54	10	19	16	32	52	50
8.5	7	19	2	4	29	78	43	79	1	3	9	17	37	54
9.5	5	11	6	11	35	78	43	77	5	11	7	13	45	56
10.5	8	17	....	....	38	81	43	84	1	2	8	16	47	51
11.5	11	21	6	11	39	75	37	70	2	4	10	19	52	53
12.5	16	32	8	13	33	66	38	60	1	2	17	27	50	63
13.5	13	32	9	15	27	66	44	75	1	2	6	10	41	59
14.5	12	39	11	21	19	61	38	73	....	....	3	6	31	52
15.5	7	39	4	11	10	55	29	76	1	6	5	13	18	38
16.5	5	42	3	12	7	58	19	76	....	....	3	12	12	25
17.5	2	29	3	18	5	71	13	76	....	....	1	6	7	17
18.5	1	33	1	25	2	67	2	50	....	....	1	25	3	4
19.5	....	....	1	33	2	100	2	67	....	....	....	....	2	3
Totals	100	24	62	11	299	70	399	72	26	6	92	17	425	553

TABLE XXXIX. HAIR TEXTURE, *continued*

HAWAIIAN-ASIATIC

Age	Coarse				Medium				Fine				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	1	50	2	100	1	50	....	....	....	....	2	2
6.5	11	50	1	8	10	45	11	84	1	5	1	8	22	13
7.5	20	61	7	21	13	39	25	76	....	....	1	3	33	33
8.5	20	56	13	36	16	44	22	61	....	....	1	3	36	36
9.5	23	72	20	48	9	28	22	52	....	....	....	....	32	42
10.5	27	75	23	62	9	25	13	35	....	....	1	3	36	37
11.5	19	70	13	54	8	30	11	46	....	....	....	....	27	24
12.5	20	87	28	85	3	13	5	15	....	....	....	....	23	33
13.5	20	87	18	58	3	13	13	42	....	....	....	....	23	31
14.5	26	100	22	85	....	....	4	15	....	....	....	....	26	26
15.5	12	86	13	72	2	14	5	28	....	....	....	....	14	18
16.5	8	100	24	89	....	....	3	11	....	....	....	....	8	27
17.5	3	75	5	42	1	25	7	58	....	....	....	....	4	12
18.5	7	88	6	67	1	12	3	33	....	....	....	....	8	9
19.5	4	50	6	100	4	50	....	....	....	....	....	....	8	6
Totals	220	73	200	57	81	27	145	42	1	....	4	1	302	349

HAWAIIAN-NORTH EUROPEAN

Age	Coarse				Medium				Fine				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	....	....	1	100	1	50	....	....	1	50	1	2
6.5	3	13	2	10	17	71	14	70	4	17	4	20	24	20
7.5	9	27	7	19	20	61	28	78	4	12	1	3	33	36
8.5	9	19	5	13	37	77	29	76	2	4	4	11	48	38
9.5	6	17	10	21	28	77	35	75	2	6	2	4	36	47
10.5	12	27	13	28	32	73	31	66	....	....	3	7	44	47
11.5	23	40	14	25	33	58	39	71	1	2	2	4	57	55
12.5	25	56	8	23	20	44	26	77	....	....	....	....	45	34
13.5	17	45	12	23	20	53	40	77	1	3	....	....	38	52
14.5	18	50	21	47	18	50	24	53	....	....	....	....	36	45
15.5	11	38	20	39	18	62	29	57	....	....	2	4	29	51
16.5	9	33	17	49	18	67	17	49	....	....	1	2	27	35
17.5	8	44	13	46	10	56	14	50	....	....	1	4	18	28
18.5	9	50	5	24	9	50	16	76	....	....	....	....	18	21
19.5	9	69	5	38	4	31	4	30	....	....	1	8	13	10
Totals	168	36	152	29	285	61	347	67	14	3	22	4	467	521

HAWAIIAN-SOUTH EUROPEAN

Age	Coarse				Medium				Fine				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	....	....	1	100	....	....	....	....	....	....	1	....
6.5	2	25	....	....	6	75	4	100	....	....	....	....	8	4
7.5	3	25	....	....	8	67	13	100	1	8	....	....	12	13
8.5	5	24	3	30	15	71	6	60	1	5	1	10	21	10
9.5	9	43	4	25	11	52	11	69	1	5	1	6	21	16
10.5	7	44	5	39	9	56	8	61	....	....	....	....	16	13
11.5	11	50	6	35	10	45	11	65	1	5	....	....	22	17
12.5	7	59	9	64	4	33	5	36	1	8	....	....	12	14
13.5	8	47	13	62	9	53	8	38	....	....	....	....	17	21
14.5	2	33	11	73	4	67	4	27	....	....	....	....	6	15
15.5	8	80	8	67	2	20	4	33	....	....	....	....	10	12
16.5	2	50	8	67	2	50	4	33	....	....	....	....	4	12
17.5	1	100	3	75	....	....	1	25	....	....	....	....	1	4
18.5	2	50	3	75	2	50	1	25	....	....	....	....	4	4
Totals	67	43	73	47	83	54	80	52	5	3	2	1	155	155

TABLE XXXIX. HAIR TEXTURE, *continued*

HAWAIIAN-ASIATIC-EUROPEAN

Age	Coarse				Medium				Totals	
	Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	No.
6.5	1	33	....	....	2	67	3	100	3	3
7.5	7	54	1	6	6	46	15	94	13	16
8.5	6	43	1	10	8	57	9	90	14	10
9.5	4	36	4	44	7	64	5	56	11	9
10.5	7	54	1	7	5	38	14	93	13[a]	15
11.5	4	36	4	33	7	64	8	67	11	12
12.5	6	55	5	45	5	45	6	55	11	11
13.5	5	50	6	60	5	50	4	40	10	10
14.5	8	67	9	69	4	33	4	31	12	13
15.5	3	100	8	57	....	....	6	43	3	14
16.5	7	78	6	86	2	22	1	14	9	7
17.5	2	50	5	56	2	50	4	44	4	9
18.5	1	100	1	100	....	....	....	....	1	1
19.5	....	....	1	33	1	100	2	67	1	3
Totals	61	53	52	39	54	46	81	61	116	133

[a] This total includes a single case of fine textured hair.

TABLE XL. HAIR TEXTURE, COMPARISON OF RACES

Group	Coarse				Medium				Fine				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
Hawaiian	165	73	157	65	62	27	82	34	....	....	2	1	227	241
Chinese	693	88	435	60	93	12	293	40	1	....	....	....	787	728
Japanese	1043	87	600	63	150	13	334	36	2	....	4	1	1195	938
North European	7	2	5	1	257	61	258	61	157	37	159	38	421	422
South European	100	24	62	11	299	70	399	72	26	6	92	17	425	553
Korean	94	74	58	56	33	26	46	44	....	....	....	....	127	104
Haw.-Asiatic	220	73	200	57	81	27	145	42	1	....	4	1	302	349
Haw.-N. European	168	36	152	29	285	61	347	67	14	3	22	4	467	521
Haw.-S. European	67	43	73	47	83	54	80	52	5	3	2	1	155	155
Haw.-Asiatic-Eur.	62	53	52	39	54	46	81	61	1	1	....	....	117	133

TABLE XLI. EYE COLOR

HAWAIIAN [a]

Age	Black				Dark Brown				Light Brown				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
6.5	....	....	....	....	8	89	5	100	1	11	....	....	9	5
7.5	1	7	1	5	13	93	18	95	....	....	....	....	14	19
8.5	....	....	....	....	20	100	30	94	....	....	2	6	20	32
9.5	....	....	....	....	19	90	15	94	2	10	1	6	21	16
10.5	3	8	....	....	30	84	26	84	3	8	5	16	36	31
11.5	....	....	....	....	29	94	19	100	2	6	....	....	31	19
12.5	4	14	....	....	22	79	27	96	2	7	1	4	28	28
13.5	3	11	1	4	22	85	22	96	1	4	....	....	26	23
14.5	2	7	2	7	23	76	23	76	5	17	5	17	30	30
15.5	2	11	3	14	13	72	17	77	3	17	2	9	18	22
16.5	2	15	2	13	10	77	12	80	1	8	1	7	13	15
17.5	....	....	4	17	10	100	17	74	....	....	2	9	10	23
18.5	....	....	....	....	7	100	12	100	....	....	....	....	7	12
19.5	....	....	1	17	5	100	5	83	....	....	....	....	5	6
Totals	17	6	14	5	231	86	248	88	20	8	19	7	268	281
Adult	3	1	6	4	188	92	160	92	12	6	7	4	204[b]	173

[a] No blue, gray, blue-brown, or gray-brown eyes were recorded.
[b] Total includes one case of blue-brown eyes.

TABLE XLI. EYE COLOR, *continued*

CHINESE [a]

Age	Black				Dark Brown				Light Brown				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	2	40	4	44	3	60	5	56	....	....	....	....	5	9
6.5	6	13	11	30	40	83	24	65	2	4	2	5	48	37
7.5	15	18	12	16	66	81	62	81	1	1	2	3	82	76
8.5	9	13	7	12	59	84	48	81	2	3	4	7	70	59
9.5	15	20	9	12	54	73	61	81	5	7	5	7	74	75
10.5	14	19	9	13	57	80	56	84	1	1	2	3	72	67
11.5	12	15	6	11	63	80	46	84	4	5	3	5	79	55
12.5	6	11	6	9	48	84	58	86	3	5	3	4	57	67
13.5	6	9	5	9	54	82	45	82	6	9	5	9	66	55
14.5	1	2	6	9	64	95	59	85	2	3	4	6	67	69
15.5	4	8	3	5	41	84	44	79	4	8	9	16	49	56
16.5	....	....	....	....	37	82	39	91	8	18	4	9	45	43
17.5	....	....	....	....	26	74	35	90	9	26	4	10	35	39
18.5	....	....	....	....	25	83	12	86	5	17	2	14	30	14
19.5	....	....	1	12	10	100	6	75	....	....	1	12	10	8
Totals	90	11	79	11	647	82	600	82	52	7	50	7	789	729
Adult	....	....	....	....	10	100	1	100	....	....	....	....	10	1

[a] No cases of blue, gray, blue-brown, or gray-brown eyes were recorded.

JAPANESE [a]

Age	Black				Dark Brown				Light Brown				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	1	100	....	....	....	....	....	....	....	....	....	1
6.5	13	18	16	28	58	79	41	70	2	3	1	2	73	58
7.5	18	17	20	17	79	76	94	80	7	7	4	3	104	118
8.5	14	13	14	15	89	81	75	78	7	6	7	7	110	96
9.5	6	6	11	12	86	89	84	87	5	5	1	1	97	96
10.5	6	6	11	11	83	83	86	84	11	11	5	5	100	102
11.5	7	9	8	9	68	84	72	85	6	7	5	6	81	85
12.5	3	3	8	9	89	86	77	85	11	11	5	6	103	90
13.5	7	7	8	9	88	86	78	86	7	7	5	5	102	91
14.5	3	2	8	11	109	89	61	84	11	9	4	5	123	73
15.5	3	3	2	3	90	86	59	91	12	11	4	6	105	65
16.5	4	5	....	....	70	80	27	93	13	15	2	7	87	29
17.5	....	....	....	....	43	72	15	83	17	28	3	17	60	18
18.5	....	....	....	....	30	79	8	62	8	21	5	38	38	13
19.5	1	7	....	....	11	73	2	50	3	20	2	50	15	4
Totals	85	7	107	11	993	83	779	83	120	10	53	6	1198	939
Adult	....	....	....	....	19	76	3	75	6	24	1	25	25	4

[a] No cases of blue, gray, blue-brown, or gray-brown eyes were recorded.

KOREAN [a]

Age	Black				Dark Brown				Light Brown				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	1	25	....	....	3	75	1	100	....	....	....	....	4	1
6.5	1	25	....	....	2	50	4	100	1	25	....	....	4	4
7.5	2	29	1	20	5	71	4	80	....	....	....	....	7	5
8.5	....	....	....	....	6	100	4	100	....	....	....	....	6	4
9.5	1	12	2	22	6	75	6	67	1	12	1	11	8	9
10.5	....	....	....	....	13	100	6	100	....	....	....	....	13	6
11.5	1	8	....	....	10	77	9	90	2	15	1	10	13	10
12.5	1	7	....	....	12	80	4	67	2	13	2	33	15	6
13.5	....	....	....	....	14	100	10	83	....	....	2	17	14	12
14.5	....	....	....	....	15	88	11	100	2	12	....	....	17	11
15.5	....	....	1	5	7	78	19	86	2	22	2	9	9	22
16.5	....	....	....	....	5	71	8	89	2	29	1	11	7	9
17.5	....	....	....	....	5	83	3	75	1	17	1	25	6	4
18.5	....	....	....	....	....	....	....	....	2	100	....	....	2	....
19.5	....	....	....	....	1	50	....	....	1	50	....	....	2	....
Totals	7	5	4	5	104	82	89	85	16	13	10	10	127	103
Adult	....	....	....	....	4	80	....	....	1	20	....	....	5	....

[a] No cases of blue, gray, blue-brown, or gray-brown eyes were recorded.

TABLE XLI. EYE COLOR, *continued*

NORTH EUROPEAN [a]

Age	Dark Brown				Light Brown				Blue				Gray				Blue-Brown				Gray-Brown				Totals	
	Male		Female		Male		Female		Male		Female		Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	1	100	....	....	....	....	1	33	....	....	2	67	....	....	....	....	....	....	....	....	....	....	....	....	1	3
6.5	4	19	....	....	4	19	8	44	5	24	7	39	2	9	1	6	5	24	2	11	1	5	....	....	21	18
7.5	6	18	3	10	5	15	4	14	13	40	15	52	1	3	2	7	6	18	2	7	2	6	3	10	33	29
8.5	3	9	5	13	8	22	9	24	17	48	14	37	3	9	....	....	3	9	4	10	1	3	6	16	35	38
9.5	4	8	2	7	13	27	9	29	21	44	10	32	3	6	....	....	5	11	5	16	2	4	5	16	48	31
10.5	7	14	6	21	11	22	7	25	19	38	7	25	2	4	1	4	10	20	2	7	1	2	5	18	50	28
11.5	3	7	2	9	5	12	1	5	17	43	11	50	2	5	3	13	7	18	4	18	6	15	1	5	40	22
12.5	5	15	4	9	5	15	9	21	12	37	17	41	2	6	2	5	6	18	5	12	3	9	5	12	33	42
13.5	6	16	2	5	5	14	9	22	12	32	15	37	4	11	2	5	6	16	5	12	4	11	8	19	37	41
14.5	8	21	5	10	5	13	7	14	12	31	19	38	1	3	2	4	6	16	8	16	6	16	9	18	38	50
15.5	3	8	8	19	9	23	5	12	13	34	15	36	1	3	4	9	6	16	7	17	6	16	3	7	38	42
16.5	2	9	5	14	4	17	2	6	10	43	10	29	2	9	1	3	3	13	12	34	2	9	5	14	23	35
17.5	....	....	4	15	4	23	5	19	9	53	7	27	1	4	1	4	1	6	6	23	3	18	3	12	17	26
18.5	....	....	1	7	....	....	2	15	2	50	5	39	....	....	....	....	2	50	5	39	....	....	....	....	4	13
19.5	1	17	....	....	1	17	....	....	2	33	4	80	2	33	....	....	....	....	1	20	....	....	....	....	6	5
Totals	53	12	47	11	79	19	78	18	164	39	158	38	25	6	19	4	66	15	68	16	37	9	53	13	424	423
Adult	....	....	1	8	2	29	1	8	5	71	8	62	....	....	....	....	....	....	2	14	....	....	1	8	7	13

[a] No black eyes were recorded.

SOUTH EUROPEAN

Age	Black				Dark Brown				Light Brown				Blue				Gray				Blue-Brown				Gray-Brown				Totals	
	Male		Female		Male		Female		Male		Female		Male		Female		Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	....	....	....	....	1	100	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....		1
6.5	....	....	....	....	19	64	19	67	6	20	8	29	3	10	....	....	....	....	....	....	1	3	....	....	1	3	1	4	30	28
7.5	....	....	2	4	38	73	30	60	8	15	12	24	3	6	1	2	....	....	....	....	2	4	3	6	1	2	2	4	52	50
8.5	1	3	1	2	23	62	35	65	12	32	12	22	....	....	1	2	....	....	1	2	1	3	3	5	....	....	1	2	37	54
9.5	....	....	1	2	32	71	33	59	8	17	17	30	2	4	3	5	1	2	....	....	1	2	2	4	2	4	....	....	46	56
10.5	1	2	....	....	34	71	36	70	10	21	10	20	....	....	1	2	....	....	1	2	3	6	1	2	....	....	2	4	48	51
11.5	1	2	1	2	27	50	39	72	16	29	13	24	2	4	1	2	1	2	....	....	5	9	....	....	2	4	....	....	54	54
12.5	2	4	1	2	32	59	39	60	13	24	19	20	1	2	1	2	1	2	....	....	4	7	2	3	1	2	2	3	54	64
13.5	1	2	1	2	23	51	39	64	16	36	11	18	....	....	....	....	1	2	1	2	4	9	4	7	....	....	4	7	45	60
14.5	1	3	5	9	22	62	34	62	7	20	10	18	1	3	1	2	....	....	....	....	3	9	3	5	1	3	2	4	35	55
15.5	2	10	....	....	7	37	21	53	7	37	14	35	....	....	1	2	....	....	1	2	2	10	....	....	1	5	3	8	19	40
16.5	....	....	....	....	3	25	15	51	9	75	6	20	....	....	1	4	....	....	1	4	....	....	1	4	....	....	5	17	12	29
17.5	....	....	....	....	2	29	15	60	4	57	7	28	....	....	....	....	....	....	....	....	....	....	2	8	1	14	1	4	7	25
18.5	....	....	....	....	3	75	6	75	1	25	2	25	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	8
19.5	....	....	1	12	1	50	5	63	1	50	2	25	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	8
Totals	9	2	13	2	266	59	367	63	148	27	143	24	12	3	11	2	4	1	5	1	26	6	21	4	10	2	23	4	445	583
Adult	....	....	....	....	2	67	4	67	1	33	2	33	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	6

TABLE XLI. EYE COLOR, *continued*

HAWAIIAN-ASIATIC [a]

Age	Black				Dark Brown				Light Brown				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	....	....	2	100	2	100	....	....	....	....	2	2
6.5	3	13	....	....	18	78	13	100	2	9	....	....	23	13
7.5	5	15	3	9	27	79	30	91	2	6	....	....	34	33
8.5	1	3	2	5	32	89	35	92	3	8	1	3	36	38
9.5	2	6	....	....	28	82	41	98	4	12	1	2	34	42
10.5	4	10	3	8	29	75	33	89	6	15	1	3	39	37
11.5	....	....	....	....	24	89	24	100	3	11	....	....	27	24
12.5	1	4	....	....	22	92	31	94	1	4	2	6	24	33
13.5	1	4	....	....	18	75	30	91	5	21	3	9	24	33
14.5	2	7	....	....	21	78	27	96	4	15	1	4	27	28
15.5	1	6	2	9	14	77	19	86	3	17	1	5	18	22
16.5	....	....	5	16	6	75	26	81	2	25	1	3	8	32
17.5	....	....	1	7	5	83	14	93	1	17	....	....	6	15
18.5	....	....	3	20	7	88	12	80	1	12	....	....	8	15
19.5	....	....	1	12	7	88	6	75	1	12	1	12	8	8
Totals	20	6	20	5	260	82	343	92	38	12	12	3	318	375
Adult	1	3	3	10	28	88	27	90	3	9	....	....	32	30

[a] No blue, gray, blue-brown, or gray-brown eyes were recorded.

HAWAIIAN-NORTH EUROPEAN

Age	Black				Dark Brown				Light Brown				Blue				Gray				Blue-Brown				Gray-Brown				Totals	
	Male		Female		Male		Female		Male		Female		Male		Female		Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	....	....	1	100	1	50	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	50	....	....	....	....	1	2
6.5	1	4	1	5	14	59	16	80	8	33	2	10	1	4	1	5	....	....	....	....	....	....	....	....	....	....	....	....	24	20
7.5	1	3	1	3	20	61	22	61	6	18	6	17	2	6	3	8	....	....	....	....	4	12	4	11	....	....	....	....	23	36
8.5	....	....	....	....	25	53	23	60	15	31	14	37	2	4	....	....	2	4	....	....	2	4	....	....	2	4	1	3	48	38
9.5	....	....	....	....	17	47	29	62	14	39	12	26	1	3	3	6	....	....	1	2	1	3	1	2	3	8	1	2	36	47
10.5	....	....	....	....	20	46	30	64	19	43	10	22	....	....	2	4	....	....	1	2	5	11	3	6	....	....	1	2	44	47
11.5	....	....	....	....	29	51	32	59	17	30	11	20	3	5	1	2	....	....	3	5	5	9	4	7	3	5	4	7	57	55
12.5	....	....	....	....	29	62	20	58	15	32	7	21	3	6	4	12	....	....	....	....	....	....	1	3	....	....	2	6	47	34
13.5	1	2	....	....	22	55	33	58	13	32	15	27	1	2	2	4	1	2	2	4	2	5	1	2	1	2	3	5	41	56
14.5	1	2	....	....	20	50	28	56	13	33	16	32	2	5	....	....	....	....	1	2	4	10	4	8	....	....	1	2	40	50
15.5	....	....	....	....	15	50	28	51	10	33	19	34	1	3	2	4	2	7	3	5	1	3	2	4	1	3	1	2	30	55
16.5	2	7	2	5	16	52	26	68	9	29	9	23	1	3	....	....	1	3	....	....	1	3	....	....	1	3	1	3	31	38
17.5	....	....	1	3	9	47	18	49	7	37	12	32	....	....	....	....	....	....	....	....	2	11	2	5	1	5	7	11	19	37
18.5	....	....	1	4	8	44	12	48	9	50	7	28	1	6	....	....	....	....	2	8	....	....	1	4	....	....	2	8	18	25
19.5	....	....	1	8	5	38	8	62	7	54	2	15	1	8	2	15	....	....	....	....	....	....	....	....	....	....	....	....	13	13
Totals	6	1	7	1	250	52	326	59	162	34	142	26	19	4	20	4	6	1	13	2	27	6	24	4	12	2	2	4	482	553
Adult	2	3	....	....	34	50	58	74	27	40	18	22	3	4	1	1	....	....	....	....	1	1	2	3	1	1	....	....	68	79

TABLE XLI. EYE COLOR, *continued*

HAWAIIAN-SOUTH EUROPEAN [a]

Age	Black				Dark Brown				Light Brown				Blue				Blue-Brown				Gray-Brown				Totals	
	Male		Female		Male		Female		Male		Female		Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	....	....	....	....	....	....	1	100	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	0
6.5	....	....	....	....	6	75	4	100	1	12	....	....	1	12	....	....	....	....	....	....	....	....	....	....	8	4
7.5	....	....	1	8	11	92	8	61	1	8	4	31	....	....	....	....	....	....	....	....	....	....	....	....	12	13
8.5	....	....	2	20	14	67	6	60	7	33	2	20	....	....	....	....	....	....	....	....	....	....	....	....	21	10
9.5	....	....	....	....	19	91	13	81	2	9	2	13	....	....	....	....	....	....	1	6	....	....	....	....	21	16
10.5	....	....	....	....	12	75	11	85	2	13	2	15	....	....	....	....	1	6	....	....	1	6	....	....	16	13
11.5	1	5	....	....	18	81	14	77	3	14	3	17	....	....	....	....	....	....	1	6	....	....	....	....	22	18
12.5	1	8	....	....	9	75	13	93	2	17	....	....	....	....	1	7	....	....	....	....	....	....	....	....	12	14
13.5	....	....	....	....	14	78	20	95	4	22	1	5	....	....	....	....	....	....	....	....	....	....	....	....	18	21
14.5	1	14	1	6	6	86	13	76	....	....	3	18	....	....	....	....	....	....	....	....	....	....	....	....	7	17
15.5	1	8	....	....	7	59	8	67	3	25	2	17	....	....	1	8	1	8	....	....	....	....	1	8	12	12
16.5	....	....	2	13	4	80	11	74	1	20	2	13	....	....	....	....	....	....	....	....	....	....	....	....	5	15
17.5	....	....	3	33	3	100	3	33	....	....	2	22	....	....	....	....	....	....	....	....	....	....	1	11	3	9
18.5	1	20	1	11	3	60	8	89	1	20	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5	9
19.5	....	....	....	....	....	....	2	100	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	2
Totals	5	3	10	6	126	77	134	78	28	17	23	13	1	1	2	1	2	1	2	1	1	1	2	1	163	173
Adult	....	....	....	....	15	79	....	....	4	21	....	....	....	....	....	....	....	....	....	....	....	....	....	....	19	....

[a] No gray eyes were recorded.

HAWAIIAN-ASIATIC-EUROPEAN [a]

Age	Black				Dark Brown				Light Brown				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
6.5	....	....	....	....	2	67	3	100	1	33	....	....	3	3
7.5	....	....	2	13	11	85	13	81	2	15	1	6	13	16
8.5	1	7	....	....	9	64	7	70	4	29	3	30	14	10
9.5	....	....	....	....	8	73	8	89	3	27	1	11	11	9
10.5	....	....	....	....	11	85	9	60	2	15	6	40	13	15
11.5	....	....	....	....	6	55	10	83	5	45	2	17	11	12
12.5	....	....	1	8	6	55	8	67	5	45	3	25	11	12
13.5	....	....	1	9	8	73	9	82	3	27	1	9	11	11
14.5	....	....	1	6	7	59	10	63	4	33	3	19	12[b]	16[c]
15.5	1	25	2	12	3	75	14	82	....	....	1	6	4	17
16.5	....	....	2	22	8	80	7	78	2	20	....	....	10	9
17.5	....	....	....	....	4	100	8	80	....	....	2	20	4	10
18.5	....	....	....	....	1	100	2	100	....	....	....	....	1	2
19.5	....	....	....	....	1	100	1	33	....	....	2	67	1	3
Totals	2	2	9	6	85	71	109	75	31	26	25	17	119	145
Adult	....	....	....	....	1	100	5	100	....	....	....	....	1	5

[a] No gray or gray-brown eyes were noted.
[b] Total includes one case of blue-brown eyes.
[c] Total includes one case of blue eyes and one of blue-brown.

TABLE XLII. EYE COLOR, COMPARISON OF RACES

Group	Black				Dark Brown				Light Brown				Blue				Gray				Blue-Brown				Gray-Brown				Totals	
	Male		Female		Male		Female		Male		Female		Male		Female		Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
Hawaiian	17	6	14	5	231	86	248	88	20	8	19	7	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	268	281
Chinese	90	11	79	11	647	82	600	82	52	7	50	7	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	789	729
Japanese	85	7	107	11	993	83	779	83	120	10	53	6	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1198	939
North European	....	....	....	....	53	12	47	11	79	19	78	18	164	39	158	38	25	6	19	4	66	15	68	16	37	9	53	13	424	423
South European	9	2	13	2	266	59	367	63	148	27	143	24	12	3	11	2	4	1	5	1	26	6	21	4	10	2	23	4	445	583
Korean	7	5	5	5	104	82	89	85	16	13	10	10	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	127	104
Haw.-Asiatic	20	6	20	5	260	82	343	92	38	12	12	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	318	375
Haw.-N. European	6	1	7	1	250	52	326	59	162	34	142	26	19	4	20	4	6	1	13	2	27	6	24	4	12	2	21	4	482	553
Haw.-S. European	5	3	10	6	126	77	134	78	28	17	23	13	1	1	2	1	....	....	....	....	2	1	2	1	1	1	2	1	163	173
Haw.-Asiatic-Eur.	2	2	9	6	85	71	109	75	31	26	25	17	....	....	1	1	....	....	....	....	1	1	1	1	....	....	....	....	119	145

TABLE XLIII. EPICANTHIC EYEFOLD

HAWAIIAN

Age	Absent				Trace				Medium				Marked				Totals	
	Male		Female		Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
6.5	4	44	2	40	5	56	2	40	....	....	1	20	....	....	....	....	9	5
7.5	2	14	11	58	9	65	6	32	2	14	2	10	1	7	....	....	14	19
8.5	9	45	17	53	10	50	15	47	1	5	....	....	....	....	....	....	20	32
9.5	12	57	2	13	5	24	9	56	3	14	5	31	1	5	....	....	21	16
10.5	20	55	13	45	11	31	15	52	4	11	1	3	1	3	....	....	36	29
11.5	16	51	11	58	7	23	7	37	7	23	1	5	1	3	....	....	31	19
12.5	16	57	15	55	10	35	11	41	1	4	1	4	1	4	....	....	28	27
13.5	9	35	15	65	14	54	7	31	3	11	1	4	....	....	....	....	26	23
14.5	16	53	11	37	8	27	15	50	4	13	4	13	2	7	....	....	30	30
15.5	9	50	14	63	5	28	5	23	4	22	3	14	....	....	....	....	18	22
16.5	9	69	4	27	1	8	6	40	2	15	4	27	1	8	1	6	13	15
17.5	5	63	5	22	1	12	14	61	1	12	3	13	1	12	1	4	8	23
18.5	3	50	3	25	2	33	3	25	....	....	4	33	1	17	2	17	6	12
19.5	2	40	4	80	2	40	....	....	1	20	1	20	....	....	....	....	5	5
Total	132	50	127	46	90	34	115	42	33	12	31	11	10	4	4	1	265	277
Adult	172	87	132	78	18	9	29	17	6	3	7	4	2	1	1	1	198	169

CHINESE

Age	Absent				Trace				Medium				Marked				Totals	
	Male		Female		Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	....	....	....	....	1	11	2	40	4	44	3	60	4	44	5	9
6.5	....	....	1	3	2	4	1	3	33	69	20	54	13	27	15	40	48	37
7.5	3	4	....	....	....	....	5	7	59	72	55	72	20	24	16	21	82	76
8.5	2	3	2	3	3	4	....	....	49	70	42	71	16	23	15	26	70	59
9.5	1	1	....	....	4	5	2	3	55	75	55	73	14	19	18	24	74	75
10.5	....	....	....	....	4	6	2	3	48	66	50	75	20	28	15	22	72	67
11.5	....	....	....	....	3	4	2	4	61	77	48	87	15	19	5	9	79	55
12.5	....	....	....	....	1	2	1	2	39	69	52	77	16	29	14	21	56	67
13.5	....	....	1	2	....	....	1	2	52	79	35	63	14	21	18	33	66	55
14.5	....	....	....	....	2	3	6	9	45	67	53	77	20	30	10	14	67	69
15.5	1	2	....	....	1	2	1	2	31	68	42	75	13	28	13	23	46	56
16.5	1	2	....	....	4	9	3	7	34	76	31	72	6	13	9	21	45	43
17.5	....	....	1	3	3	9	2	5	27	77	25	64	5	14	11	28	35	39
18.5	1	3	....	....	2	7	1	7	22	73	9	64	5	17	4	29	30	14
19.5	....	....	....	....	2	20	1	12	7	70	7	88	1	10	....	....	10	8
Total	9	1	5	1	31	4	29	4	564	72	528	72	181	23	167	23	785	729
Adult	....	....	....	....	....	....	....	....	8	80	1	100	2	20	....	....	10	1

JAPANESE

Age	Absent				Trace				Medium				Marked				Totals	
	Male		Female		Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	....	....	....	....	1	100	....	....	....	....	....	....	....	....	....	1
6.5	1	1	....	....	1	3	3	5	36	49	27	47	34	47	28	48	73	58
7.5	3	3	3	2	1	1	3	2	61	59	70	60	39	37	42	36	104	118
8.5	1	1	....	....	....	....	3	3	73	66	60	63	36	33	33	34	110	96
9.5	1	1	2	2	....	....	....	....	74	76	67	70	22	23	27	28	97	96
10.5	....	....	1	1	2	2	....	....	73	74	76	74	24	24	26	25	99	103
11.5	1	1	....	....	1	1	....	....	49	63	62	73	27	35	23	27	78	85
12.5	....	....	....	....	....	....	1	1	73	71	67	75	30	29	22	24	103	90
13.5	1	1	1	1	2	2	3	3	72	71	59	65	27	26	28	31	102	91
14.5	1	1	....	....	2	2	....	....	73	59	46	63	46	38	27	37	122	73
15.5	....	....	....	....	1	1	6	9	70	67	43	66	34	32	16	25	105	65
16.5	1	1	....	....	3	4	2	7	63	72	17	59	20	23	10	34	87	29
17.5	....	....	....	....	3	5	3	17	51	85	10	55	6	10	5	28	60	18
18.5	....	....	....	....	3	8	3	23	26	68	4	31	9	24	6	46	38	13
19.5	....	....	....	....	2	13	....	....	10	67	4	100	3	20	....	....	15	4
Total	10	1	7	1	22	2	28	3	804	67	612	65	357	30	293	31	1193	940
Adult	....	....	....	....	....	....	....	....	24	96	1	25	1	4	3	75	25	4

TABLE XLIII. EPICANTHIC EYEFOLD, *continued*

KOREAN

Age	Medium				Marked				Totals	
	Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	2	50	....	....	2	50	1	100	4	1
6.5	2	50	2	50	2	50	2	50	4	4
7.5	4	57	4	80	2	29	1	20	7[a]	5
8.5	4	67	2	50	2	33	2	50	6	4
9.5	3	37	4	44	5	63	5	56	8	9
10.5	4	31	3	50	9	69	3	50	13	6
11.5	6	46	5	50	6	46	5	50	13[b]	10
12.5	5	33	3	50	10	67	3	50	15	6
13.5	6	43	7	58	8	57	5	42	14	12
14.5	6	35	7	64	11	65	4	36	17	11
15.5	5	56	16	73	4	44	6	27	9	22
16.5	4	57	6	67	3	43	3	33	7	9
17.5	3	50	3	75	3	50	1	25	6	4
18.5	2	100	....	....	....	....	....	....	2	....
19.5	1	50	....	....	1	50	....	....	2	....
Total	57	45	62	60	68	53	41	40	126	103
Adult	5	100	....	....	....	....	....	....	5	....

[a] Total includes one case where the eyefold was absent.
[b] Total includes one case of a trace of eyefold.

HAWAIIAN-ASIATIC

Age	Absent				Trace				Medium				Marked				Totals	
	Male		Female		Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	....	....	1	50	....	....	1	50	1	50	....	....	1	50	2	2
6.5	1	4	3	23	6	26	3	23	12	53	7	54	4	17	....	....	23	13
7.5	6	18	3	9	3	9	8	24	19	55	18	55	6	18	4	12	34	33
8.5	3	8	4	11	4	11	9	24	19	53	22	60	10	28	2	5	36	37
9.5	3	9	5	12	6	18	11	26	17	50	19	45	8	23	7	17	34	42
10.5	3	8	3	8	14	36	10	27	14	36	15	41	8	20	9	24	39	37
11.5	2	7	4	17	6	22	6	25	12	45	13	54	7	26	1	4	27	24
12.5	1	4	4	12	5	21	8	24	13	54	18	55	5	21	3	9	24	33
13.5	2	8	2	6	6	25	12	36	13	54	16	49	3	13	3	9	24	33
14.5	3	11	3	11	7	26	6	21	11	41	10	36	6	22	9	32	27	28
15.5	1	6	3	13	4	24	7	32	6	35	5	23	6	35	7	32	17	22
16.5	3	37	6	19	1	13	9	28	2	25	11	34	2	25	6	19	8	32
17.5	1	17	4	27	1	17	3	20	3	50	8	53	1	17	....	....	6	15
18.5	....	....	1	7	4	50	3	20	2	25	8	53	2	25	3	20	8	15
19.5	....	....	1	13	4	50	4	50	2	25	3	37	2	25	....	....	8	8
Total	29	9	46	12	72	23	99	26	146	46	174	47	70	22	55	15	317	374
Adult	12	39	7	23	6	19	7	23	11	36	13	44	2	6	3	10	31	30

HAWAIIAN-NORTH EUROPEAN

Age	Absent				Trace				Medium				Marked				Totals	
	Male		Female		Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	1	50	1	100	1	50	....	....	....	....	....	....	....	....	1	2
6.5	15	63	13	65	6	25	4	20	2	8	3	15	1	4	....	....	24	20
7.5	21	64	25	69	8	24	9	25	4	12	2	6	....	....	....	....	33	36
8.5	39	81	26	70	6	13	8	22	3	6	2	5	....	....	1	3	48	37
9.5	28	77	31	66	5	14	13	28	1	3	3	6	2	6	....	....	36	47
10.5	32	73	40	87	9	20	5	11	3	7	1	2	....	....	....	....	44	46
11.5	39	68	39	71	17	30	13	24	1	2	3	5	....	....	....	....	57	55
12.5	34	72	29	85	8	17	1	3	4	9	3	9	1	2	1	3	47	34
13.5	32	78	44	78	6	15	10	18	3	7	2	4	....	....	....	....	41	56
14.5	31	78	40	80	5	13	9	18	3	7	1	2	1	2	....	....	40	50
15.5	26	87	43	78	4	13	9	16	....	....	2	4	....	....	1	2	30	55
16.5	26	84	30	79	4	13	7	18	1	3	1	3	....	....	....	....	31	38
17.5	14	74	29	79	4	21	2	5	1	5	4	11	....	....	2	5	19	37
18.5	14	78	23	92	2	11	....	....	2	11	....	....	....	....	2	8	18	25
19.5	11	84	10	77	1	8	2	15	1	8	....	....	....	....	1	8	13	13
Total	362	75	423	77	86	18	93	17	29	6	27	5	5	1	8	1	482	551
Adult	64	96	73	92	2	3	4	5	1	1	2	3	....	....	....	....	67	79

TABLE XLIII. EPICANTHIC EYEFOLD, *continued*

HAWAIIAN-SOUTH EUROPEAN

Age	Absent				Trace				Medium				Marked				Totals	
	Male		Female		Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
6.5	4	50	2	50	2	25	....	....	2	25	2	50	....	....	....	....	8	4
7.5	9	75	9	70	2	17	2	15	....	....	2	15	1	8	....	....	12	13
8.5	17	81	9	90	4	19	1	10	....	....	....	....	....	....	....	....	21	10
9.5	13	62	12	75	6	29	3	19	2	9	....	....	....	....	1	6	21	16
10.5	11	73	10	84	3	20	1	8	1	7	1	8	....	....	....	....	15	12
11.5	15	68	13	72	5	23	5	28	2	9	....	....	....	....	....	....	22	18
12.5	9	75	10	77	3	25	1	8	....	....	2	15	....	....	....	....	12	13
13.5	13	72	16	76	3	16	4	19	1	6	1	5	1	6	....	....	18	21
14.5	5	71	13	77	2	29	4	23	....	....	....	....	....	....	....	....	7	17
15.5	8	67	9	75	4	33	2	17	....	....	1	8	....	....	....	....	12	12
16.5	3	60	14	93	4	40	....	....	....	....	1	7	....	....	....	....	5	15
17.5	3	100	8	89	....	....	....	....	....	....	1	11	....	....	....	....	3	9
18.5	5	100	6	67	....	....	1	11	....	....	2	22	....	....	....	....	5	9
19.5	....	....	1	50	....	....	....	....	....	....	1	50	....	....	....	....	....	2
Total	115	72	132	77	36	22	24	14	8	5	14	8	2	1	1	1	161	171
Adult	17	90	....	....	1	5	....	....	1	5	....	....	....	....	....	....	19	....

TABLE XLIV. EPICANTHIC EYEFOLD, COMPARISON OF RACES

Group	Absent				Trace				Medium				Marked				Totals	
	Male		Female		Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
Hawaiian	132	50	127	46	90	34	115	42	33	12	31	11	10	4	4	1	265	277
Chinese	9	1	5	1	31	4	29	4	564	72	528	72	181	23	167	23	785	729
Japanese	10	1	7	1	22	2	28	3	804	67	612	65	357	30	293	31	1193	940
N. European	412	96	416	98	6	2	3	1	2	1	3	1	2	1	....	....	422	422
S. European	421	95	559	96	21	5	20	3	....	....	3	1	1	....	1	....	443	583
Korean	1	1	....	....	1	1	....	....	57	45	62	60	68	53	42	40	127	104
Haw.-Asiatic	29	9	46	12	72	23	99	26	146	46	174	47	70	22	55	15	317	374
Haw.-N. European	362	75	423	77	86	18	93	17	29	6	27	5	5	1	8	1	482	551
Haw.-S. European	116	72	132	77	36	22	24	14	8	5	14	8	2	1	1	1	162	171
Haw.-Asiatic-Eur.	38	32	43	30	44	37	56	39	24	20	33	23	13	11	11	8	119	143

TABLE XLV. CONDITION OF SCLERA

HAWAIIAN

Age	Percentage Clear		Total Cases	
	Male	Female	Male	Female
6.5	44	80	9	5
7.5	21	37	14	19
8.5	5	25	20	32
9.5	14	31	21	16
0.5	14	23	36	31
1.5	19	21	31	19
2.5	18	32	28	28
3.5	19	17	26	23
4.5	....	17	29	29
5.5	6	38	18	21
6.5	15	36	13	14
7.5	....	9	8	22
8.5	....	33	5	12
9.5	....	17	4	6
otal	13	26	262	277
dult	8	19	172	150

CHINESE

Age	Percentage Clear		Total Cases	
	Male	Female	Male	Female
5.5	100	100	5	9
6.5	85	92	47	37
7.5	89	97	82	76
8.5	88	97	69	59
9.5	81	87	74	75
10.5	80	87	71	67
11.5	73	89	79	55
12.5	83	88	57	66
13.5	74	91	66	55
14.5	73	90	67	69
15.5	65	84	49	56
16.5	58	79	45	43
17.5	54	74	35	39
18.5	43	93	30	14
19.5	30	63	10	8
Total	75	88	786	728
Adults	20	....	10	1

JAPANESE

Age	Percentage Clear		Total Cases	
	Male	Female	Male	Female
5.5	....	100	....	1
6.5	92	97	72	58
7.5	92	96	104	118
8.5	89	96	110	95
9.5	88	92	94	96
10.5	87	96	99	102
11.5	84	94	80	84
12.5	75	86	103	89
13.5	72	92	101	90
14.5	82	90	121	72
15.5	67	86	103	64
16.5	53	86	87	29
17.5	55	83	60	18
18.5	55	92	38	13
19.5	53	100	15	4
Total	78	92	1187	933
Adults	52	100	25	4

TABLE XLV. CONDITION OF SCLERA, *continued*

HAWAIIAN-ASIATIC

Age	Percentage Clear Male	Percentage Clear Female	Total Cases Male	Total Cases Female
5.5	100	50	2	2
6.5	55	77	22	13
7.5	52	56	33	32
8.5	56	50	36	38
9.5	58	48	33	42
10.5	44	51	39	37
11.5	37	46	27	24
12.5	25	42	24	33
13.5	37	55	24	33
14.5	48	50	27	28
15.5	35	41	17	22
16.5	14	47	7	32
17.5	33	43	6	14
18.5	25	40	8	15
19.5	....	63	7	8
Total	44	50	312	373
Adult	41	25	27	28

HAWAIIAN-NORTH EUROPEAN

Age	Percentage Clear Male	Percentage Clear Female	Total Cases Male	Total Cases Female
5.5	100	100	1	2
6.5	83	80	24	20
7.5	76	75	33	36
8.5	76	76	46	38
9.5	83	87	36	47
10.5	72	74	43	47
11.5	71	73	56	55
12.5	72	76	47	34
13.5	63	84	40	56
14.5	63	72	40	50
15.5	62	78	29	55
16.5	50	74	30	38
17.5	58	57	19	37
18.5	33	88	18	25
19.5	54	85	13	13
Total	68	77	475	553
Adult	57	84	63	76

HAWAIIAN-SOUTH EUROPEAN

Age	Percentage Clear Male	Percentage Clear Female	Total Cases Male	Total Cases Female
5.5	100	....	1	..
6.5	87	50	8	
7.5	83	85	12	1
8.5	55	70	20	1
9.5	43	56	21	1
10.5	47	69	17	1
11.5	33	56	21	1
12.5	73	50	11	1
13.5	61	57	18	2
14.5	43	71	7	1
15.5	33	25	12	1
16.5	80	47	5	1
17.5	33	56	3	
18.5	80	44	5	
Total	55	57	161	17
Adult	28	....	18	..

TABLE XLVI. CONDITION OF SCLERA, COMPARISON OF RACES

Group	Clear Male No.	Clear Male %	Clear Female No.	Clear Female %	Unclear Male No.	Unclear Male %	Unclear Female No.	Unclear Female %	Totals Male No.	Totals Female No.
Hawaiian	35	13	73	26	227	87	204	74	262	277
Chinese	592	75	644	88	194	25	84	12	786	728
Japanese	922	78	862	92	265	22	71	8	1187	933
North European	418	100	421	100	1	....	....	....	419	421
South European	425	97	571	99	12	3	8	1	437	579
Korean	94	76	88	85	30	24	16	15	124	104
Haw.-Asiatic	136	44	185	50	176	56	188	50	312	373
Haw.-N. European	323	68	424	77	152	32	129	23	475	553
Haw.-S. European	88	55	98	57	73	45	75	43	161	171
Haw.-Asiatic-Eur.	61	51	95	68	58	49	45	32	119	140

TABLE XLVII. NASAL PROFILE
HAWAIIAN

Age	Convex Male No.	Convex Male %	Convex Female No.	Convex Female %	Straight Male No.	Straight Male %	Straight Female No.	Straight Female %	Concave Male No.	Concave Male %	Concave Female No.	Concave Female %	Convex-Concave Male No.	Convex-Concave Male %	Convex-Concave Female No.	Convex-Concave Female %	Totals Male No.	Totals Female No.
6.5	1	11	....	....	3	33	1	20	5	56	4	80	....	....	....	....	9	5
7.5	....	....	1	5	7	50	4	21	7	50	13	69	....	....	1	5	14	19
8.5	5	25	7	21	6	30	4	13	9	45	17	53	....	....	4	13	20	32
9.5	8	38	6	40	1	5	2	13	10	47	6	40	2	10	1	7	21	15
10.5	13	38	6	19	11	32	7	23	7	21	16	52	3	9	2	6	34	31
11.5	7	23	8	44	9	29	3	17	12	38	7	39	3	10	....	....	31	18
12.5	8	38	10	37	4	19	6	22	7	33	9	33	2	10	2	8	21	27
13.5	4	21	6	30	10	53	4	20	5	26	5	25	....	....	5	25	19	20
14.5	13	50	14	61	10	38	5	22	3	12	4	17	....	....	....	....	26	23
15.5	7	50	5	31	4	29	5	31	2	14	4	25	1	7	2	13	14	16
16.5	3	42	2	20	2	29	1	10	2	29	6	60	....	....	1	10	7	10
17.5	2	40	3	22	1	20	2	14	2	40	7	50	....	....	2	14	5	14
18.5	2	67	....	....	1	33	7	87	....	....	1	13	....	....	....	....	3	8
19.5	1	25	....	....	2	50	1	33	....	....	2	67	1	25	....	....	4	3
Total	74	33	68	28	71	31	52	22	71	31	101	42	12	5	20	8	228	241

TABLE XLVII. NASAL PROFILE, *continued*

CHINESE

Age	Convex				Straight				Concave				Convex-Concave				Totals	
	Male		Female		Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	....	....	1	33	....	....	2	67	9	100	....	....	....	....	3	9
6.5	....	....	1	3	15	31	10	28	33	69	25	69	....	....	....	....	48	36
7.5	1	1	1	1	30	37	21	28	51	62	52	68	....	....	2	3	82	76
8.5	4	6	2	3	20	29	12	20	45	64	45	77	1	1	....	....	70	59
9.5	2	3	3	4	26	35	28	37	45	61	44	59	1	1	....	....	74	75
10.5	5	7	7	10	23	32	22	33	44	61	38	57	....	....	....	....	72	67
11.5	8	10	9	16	31	39	18	33	38	48	27	49	2	3	1	2	79	55
12.5	8	14	6	9	20	36	29	43	27	48	31	47	1	2	1	1	56	67
13.5	10	15	6	11	24	37	22	40	31	48	27	49	....	....	....	....	65	55
14.5	16	24	7	10	22	33	27	39	28	43	32	47	....	....	3	4	66	69
15.5	17	36	6	11	15	31	21	38	15	31	26	46	1	2	3	5	48	56
16.5	16	36	5	12	14	31	17	39	15	33	19	44	....	....	2	5	45	43
17.5	7	20	2	5	13	37	17	43	15	43	19	49	....	....	1	3	35	39
18.5	8	27	2	16	14	46	5	38	8	27	5	38	....	....	1	8	30	13
19.5	1	10	....	....	7	70	3	43	2	20	4	57	....	....	....	....	10	7
Total	103	13	57	8	275	35	252	34	399	52	403	56	6	1	14	2	783	726
Adult	4	44	....	....	5	56	....	....	....	....	1	100	....	....	....	....	9	1

JAPANESE

Age	Convex				Straight				Concave				Convex-Concave				Totals	
	Male		Female		Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	....	....	....	....	1	100	....	....	....	....	....	....	....	....	....	1
6.5	....	....	....	....	19	27	17	29	51	72	40	69	1	1	1	2	71	58
7.5	4	4	2	2	38	37	53	45	62	59	62	52	....	....	1	1	104	118
8.5	5	4	6	6	48	44	27	28	57	52	63	66	....	....	....	....	110	96
9.5	4	4	8	8	50	52	38	40	43	44	50	52	....	....	....	....	97	96
10.5	7	7	7	7	53	54	57	55	39	39	39	38	....	....	....	....	99	103
11.5	6	7	7	8	42	52	35	42	33	41	42	50	....	....	....	....	81	84
12.5	11	11	13	14	53	51	50	56	38	37	27	30	1	1	....	....	103	90
13.5	12	12	13	14	56	56	50	55	30	30	28	31	2	2	....	....	100	91
14.5	21	17	13	18	65	53	27	38	36	29	31	44	1	1	....	....	123	71
15.5	27	26	9	14	47	46	33	52	28	27	20	32	1	1	1	2	103	63
16.5	25	29	5	17	43	50	13	45	16	18	11	38	3	3	....	....	87	29
17.5	21	35	2	11	28	47	9	50	8	13	7	39	3	5	....	....	60	18
18.5	15	40	3	25	14	38	6	50	8	22	3	25	....	....	....	....	37	12
19.5	5	38	1	25	5	38	2	50	3	23	1	25	....	....	....	....	13	4
Total	163	14	89	9	561	47	418	45	452	38	424	45	12	1	3	1	1188	934
Adult	8	33	....	....	12	50	4	100	4	17	....	....	....	....	....	....	24	4

NORTH EUROPEAN

Age	Convex				Straight				Concave				Convex-Concave				Totals	
	Male		Female		Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	....	....	1	100	1	33	....	....	2	67	....	....	....	....	1	3
6.5	....	....	1	6	8	42	5	27	10	53	12	67	1	5	....	....	19	18
7.5	1	3	....	....	9	28	11	38	21	66	17	59	1	3	1	3	32	29
8.5	1	3	....	....	15	43	13	34	15	43	20	53	4	11	5	13	35	38
9.5	1	2	6	19	16	33	8	26	28	59	12	39	3	6	5	16	48	31
10.5	7	14	6	21	13	27	5	18	25	51	12	43	4	8	5	18	49	28
11.5	6	15	2	9	13	33	5	23	16	40	13	59	5	12	2	9	40	22
12.5	5	15	15	36	9	27	10	24	15	46	13	31	4	12	4	9	33	42
13.5	11	30	8	19	16	43	9	22	9	24	18	44	1	3	6	15	37	41
14.5	9	24	24	48	13	34	16	32	12	31	6	12	4	11	4	8	38	50
15.5	19	50	16	39	13	34	8	19	2	5	13	32	4	11	4	10	38	41
16.5	10	44	17	49	9	39	4	11	4	17	8	23	....	....	6	17	23	35
17.5	8	47	5	19	4	24	12	47	2	12	5	19	3	17	4	15	17	26
18.5	3	75	4	31	1	25	4	31	....	....	3	23	....	....	2	15	4	13
19.5	1	17	2	40	2	33	1	20	3	50	2	40	....	....	....	....	6	5
Total	82	19	106	25	142	34	112	27	162	39	156	37	34	8	48	11	420	422
Adult	1	20	3	60	2	40	2	40	2	40	....	....	....	....	....	....	5	5

TABLE XLVIII. NASAL PROFILE, *continued*

SOUTH EUROPEAN

Age	Convex				Straight				Concave				Convex-Concave				Totals	
	Male		Female		Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	....	....	....	....	....	....	....	....	1	100	....	....	....	....	....	1
6.5	1	3	2	7	18	62	8	28	10	35	17	61	....	....	1	4	29	28
7.5	....	....	3	6	25	48	21	42	27	52	24	50	....	....	....	....	52	48
8.5	1	3	7	13	17	47	24	45	18	50	21	40	....	....	1	2	36	53
9.5	5	11	7	12	12	27	17	30	26	60	30	54	1	2	2	4	44	56
10.5	9	19	9	18	12	25	20	39	21	45	18	35	5	11	4	8	47	51
11.5	11	21	15	29	23	43	16	31	18	34	18	34	1	2	3	6	53	52
12.5	7	14	20	32	22	45	25	41	17	35	15	24	3	6	2	3	49	62
13.5	7	17	13	22	19	45	27	46	15	36	15	25	1	2	4	7	42	59
14.5	2	6	21	40	20	65	20	37	8	26	9	17	1	3	3	6	31	53
15.5	6	33	11	30	7	39	14	39	4	22	9	25	1	6	2	6	18	36
16.5	5	42	4	16	5	42	19	76	2	16	1	4	....	....	1	4	12	25
17.5	2	29	5	29	1	14	9	53	2	29	2	12	2	29	1	6	7	17
18.5	....	....	....	....	2	67	3	75	1	33	....	....	....	....	1	25	3	4
19.5	....	....	....	....	2	100	2	67	....	....	1	33	....	....	....	....	2	3
Total	56	13	117	21	185	43	225	41	169	40	181	33	15	4	25	5	425	548
Adult	1	100	3	60	....	....	2	40	....	....	....	....	....	....	....	....	1	5

HAWAIIAN-ASIATIC

Age	Convex				Straight				Concave				Convex-Concave				Totals	
	Male		Female		Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	....	....	....	....	1	50	2	100	1	50	....	....	....	....	2	2
6.5	3	13	4	31	5	22	2	15	15	65	6	46	....	....	1	8	23	13
7.5	3	9	5	15	10	30	5	15	20	61	23	70	....	....	....	....	33	33
8.5	2	6	5	14	8	22	9	25	26	72	21	58	....	....	1	3	36	36
9.5	6	18	9	21	12	36	7	17	15	46	25	60	....	....	1	2	33	42
10.5	5	14	9	24	14	39	10	27	17	47	18	49	....	....	....	....	36	37
11.5	3	11	9	38	10	37	5	21	13	48	8	33	1	4	2	8	27	24
12.5	6	26	10	30	4	18	8	24	12	52	12	36	1	4	3	10	23	33
13.5	6	26	8	25	10	44	7	22	7	30	14	44	....	....	3	9	23	32
14.5	4	16	4	16	13	52	11	44	6	24	7	28	2	8	3	12	25	25
15.5	8	57	3	17	2	14	2	11	3	22	10	55	1	7	3	17	14	18
16.5	4	50	7	26	4	50	8	30	....	....	10	37	....	....	2	7	8	27
17.5	1	25	2	17	2	50	4	33	1	25	6	50	....	....	....	....	4	12
18.5	4	50	2	22	1	12	3	33	3	38	3	33	....	....	1	11	8	9
19.5	3	38	....	....	3	38	4	67	1	12	2	33	1	12	....	....	8	6
Total	58	19	77	22	98	32	86	25	141	47	166	47	6	2	20	6	303	349

HAWAIIAN-NORTH EUROPEAN

Age	Convex				Straight				Concave				Convex-Concave				Totals	
	Male		Female		Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	....	....	....	....	....	....	1	100	2	100	....	....	....	....	1	2
6.5	2	8	3	15	9	38	3	15	13	54	12	60	....	....	2	10	24	20
7.5	3	9	6	17	14	42	6	17	16	49	22	61	....	....	2	5	33	36
8.5	5	10	4	10	22	46	12	32	20	42	20	53	1	2	2	5	48	38
9.5	4	11	11	23	11	30	15	32	19	53	20	43	2	6	1	2	36	47
10.5	7	16	12	25	12	27	14	30	23	42	17	36	2	5	4	9	44	47
11.5	13	23	13	24	11	19	15	27	24	42	23	42	9	16	4	7	57	55
12.5	11	25	13	38	18	40	7	21	14	31	8	23	2	4	6	18	45	34
13.5	11	29	18	34	20	53	15	29	5	13	15	29	2	5	4	8	38	52
14.5	12	33	12	25	11	31	15	32	8	22	14	30	5	14	6	13	36	47
15.5	13	45	21	41	11	38	11	22	5	17	11	23	....	....	7	14	29	51
16.5	12	43	9	25	10	35	12	33	3	11	13	36	3	11	2	6	28	36
17.5	8	44	13	45	10	33	6	21	3	17	9	31	1	6	1	3	18	29
18.5	8	44	11	52	3	17	6	29	5	28	3	14	2	11	1	5	18	21
19.5	5	39	....	....	4	31	9	90	2	15	1	10	2	15	....	....	13	10
Total	114	24	146	28	162	35	146	28	161	34	191	36	31	7	42	8	468	525

TABLE XLVIII. NASAL PROFILE, COMPARISON OF RACES

Group	Convex				Straight				Concave				Convex-Concave				Totals	
	Male		Female		Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
Hawaiian	74	33	68	28	71	31	52	22	71	31	101	42	12	5	20	8	228	241
Chinese	103	13	57	8	275	35	252	34	399	52	403	56	6	1	14	2	783	726
Japanese	163	14	89	9	561	47	418	45	452	38	424	45	12	1	3	1	1188	934
North European	82	19	106	25	142	34	112	27	162	39	156	37	34	8	48	11	420	422
South European	56	13	117	21	185	43	225	41	169	40	181	33	15	4	25	5	425	548
Korean	27	12	7	7	49	39	40	38	47	37	54	52	2	2	3	3	125	104
Haw.-Asiatic	58	19	77	22	98	32	86	25	141	47	166	47	6	2	20	6	303	349
Haw.-North European	114	24	146	28	162	35	146	28	161	34	191	38	31	7	42	8	468	525
Haw.-South European	36	23	46	29	54	35	46	29	53	34	50	32	12	8	15	10	155	157
Haw.-Asiatic-Eur	25	22	30	22	36	31	33	25	48	41	58	44	7	6	12	9	116	133

TABLE XLIX. NOSE BRIDGE

HAWAIIAN

Age	Low				Medium				High				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
6.5	....	....	....	....	8	89	5	100	1	11	....	....	9	5
7.5	1	7	2	10	12	84	14	74	1	7	3	16	14	19
8.5	4	20	2	6	13	65	26	81	3	15	4	13	20	32
9.5	....	....	1	6	15	71	13	81	6	29	2	13	21	16
10.5	2	6	2	6	23	65	26	84	10	29	3	10	35	31
11.5	2	6	1	5	20	65	15	79	9	29	3	16	31	19
12.5	....	....	3	11	17	63	15	53	10	37	10	36	27	28
13.5	2	8	2	9	13	50	13	59	11	42	7	32	26	22
14.5	2	7	2	7	11	37	18	60	17	56	10	33	30	30
15.5	1	6	4	18	6	35	14	64	10	59	4	18	17	22
16.5	1	8	3	20	5	38	8	53	7	54	4	27	13	15
17.5	1	11	6	26	2	22	10	43	6	67	7	31	9	23
18.5	....	....	2	17	3	60	8	60	2	40	2	17	5	12
19.5	....	....	3	50	1	20	3	50	4	80	....	....	5	6
Total	16	6	33	12	149	57	188	67	97	37	59	21	262	280
Adult	41	21	76	45	113	58	80	48	41	21	12	7	195	168

CHINESE

Age	Low				Medium				High				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	3	75	5	56	1	25	4	44	....	....	....	....	4	9
6.5	17	35	15	44	30	63	19	56	1	2	....	....	48	34
7.5	35	43	34	45	46	57	41	54	....	....	1	1	81	76
8.5	24	34	20	34	44	63	38	64	2	3	1	2	70	59
9.5	27	37	23	31	43	58	52	69	4	5	....	....	74	75
10.5	10	14	15	22	56	79	50	75	5	7	2	3	71	67
11.5	10	13	5	9	62	78	47	86	7	9	3	5	79	55
12.5	11	20	12	18	38	67	50	75	7	13	5	7	56	67
13.5	3	5	8	15	56	86	41	74	6	9	6	11	65	55
14.5	6	9	10	14	44	66	53	77	17	25	6	9	67	69
15.5	5	10	12	21	29	61	39	70	14	29	5	9	48	56
16.5	3	7	3	7	28	62	35	81	14	31	5	12	45	43
17.5	1	3	16	41	16	46	22	56	18	51	1	3	35	39
18.5	1	3	6	43	11	37	6	43	18	60	2	14	30	14
19.5	1	10	2	25	3	30	6	75	6	60	....	....	10	8
Total	157	20	186	26	507	65	503	69	119	15	37	5	783	726
Adult	....	....	....	....	3	30	....	....	7	70	1	100	10	1

TABLE XLIX. NOSE BRIDGE, *continued*

JAPANESE

Age	Low				Medium				High				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	1	100	....	....	....	....	....	....	....	....	....	1
6.5	33	47	33	57	37	52	25	43	1	1	....	....	71	58
7.5	41	40	44	37	61	59	73	62	1	1	1	1	103	118
8.5	25	23	25	26	84	76	71	74	1	1	....	....	110	96
9.5	20	21	27	28	74	76	69	72	3	3	....	....	97	96
10.5	17	17	25	24	81	82	77	75	1	1	1	1	99	103
11.5	13	16	25	29	61	75	54	64	7	9	6	7	81	85
12.5	14	14	18	20	79	76	70	78	10	10	2	2	103	90
13.5	12	12	17	19	74	74	72	79	14	14	2	2	100	91
14.5	27	22	21	29	82	67	46	64	14	11	5	7	123	72
15.5	12	12	9	14	72	69	51	80	20	19	4	6	104	64
16.5	15	17	7	24	45	51	20	69	28	32	2	7	88	29
17.5	2	3	7	39	27	45	9	50	31	52	2	11	60	18
18.5	1	3	4	31	16	43	5	38	20	54	4	31	37	13
19.5	1	7	....	....	5	36	4	100	8	57	....	....	14	4
Total	233	20	263	28	798	67	646	69	159	13	29	3	1190	938
Adult	3	12	2	50	12	48	1	25	10	40	1	25	25	4

NORTH EUROPEAN

Age	Medium				High				Totals	
	Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	1	33	1	110	2	67	1	3
6.5	9	43	7	39	12	57	11	61	21	18
7.5	13	41	18	62	19	59	11	38	32	29
8.5	14	40	11	29	21	60	27	71	35	38
9.5	22	46	10	32	26	54	21	68	48	31
10.5	12	24	8	29	36	74	20	71	49[a]	28
11.5	15	37	6	27	25	63	16	73	40	22
12.5	5	15	8	19	28	85	34	81	33	42
13.5	2	5	9	22	35	95	32	78	37	41
14.5	3	8	4	8	35	92	46	92	38	50
15.5	1	3	5	12	37	97	37	88	38	42
16.5	2	9	1	3	21	91	34	97	23	35
17.5	....	....	4	15	17	100	22	85	17	26
18.5	....	....	1	8	4	100	12	92	4	13
19.5	....	....	2	40	6	100	3	60	6	5
Total	98	23	95	22	323	77	328	78	422	423
Adult	....	....	2	15	7	100	11	85	7	13

[a] This total includes the single case for low bridge in the entire North European group.

SOUTH EUROPEAN

Age	Medium				High				Totals	
	Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	1	100	....	....	....	....	....	1
6.5	11	37	18	64	19	63	10	36	30	28
7.5	19	37	16	33	33	63	32	67	52	48
8.5	10	28	19	36	26	72	33	62	36	53[a]
9.5	8	18	8	14	37	82	48	86	45	56
10.5	9	19	11	22	39	81	40	78	48	51
11.5	8	15	10	19	45	85	41	79	53	52[a]
12.5	11	21	10	16	42	79	52	82	53	63[a]
13.5	9	20	12	20	36	80	48	80	45	60
14.5	8	23	12	22	27	77	42	76	35	55[a]
15.5	5	26	9	23	14	74	30	77	19	39
16.5	4	33	4	14	8	67	25	86	12	29
17.5	2	29	3	12	5	71	20	80	7	25[b]
18.5	1	25	2	25	3	75	6	75	4	8
19.5	1	50	2	25	1	50	6	75	2	8
Total	106	24	137	24	335	76	433	75	441	576
Adult	....	....	1	17	2	100	5	83	2	6

[a] No males with low nose bridge were noted; these totals each include one case of low bridge for females.

[b] Total includes two cases of low nose bridge.

TABLE XLIX. NOSE BRIDGE, *continued*

HAWAIIAN-ASIATIC

Age	Low				Medium				High				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	2	100	2	100	....	....	....	....	....	....	2	2
6.5	6	26	2	15	15	65	9	70	2	9	2	15	23	13
7.5	5	15	7	21	27	79	26	79	2	6	....	....	34	33
8.5	6	17	7	18	25	69	29	77	5	14	2	5	36	38
9.5	5	15	4	10	25	73	34	80	4	12	4	10	34	42
10.5	5	13	5	14	27	69	29	78	7	18	3	8	39	37
11.5	5	21	1	4	21	78	18	75	1	4	5	21	27	24
12.5	....	....	3	9	20	83	24	73	4	17	6	18	24	33
13.5	1	5	3	9	15	62	24	73	8	33	6	18	24	33
14.5	....	....	3	11	20	74	15	56	7	26	9	33	27	27
15.5	2	11	3	14	5	28	12	54	11	61	7	32	18	22
16.5	....	....	11	34	2	25	15	47	6	75	6	19	8	32
17.5	1	7	3	20	4	66	6	40	1	7	6	40	6	15
18.5	....	....	6	40	....	....	9	60	8	100	....	....	8	15
19.5	1	12	2	25	1	12	5	62	6	75	1	13	8	8
Total	37	12	62	17	209	65	255	68	72	23	57	15	318	374
Adult	6	19	16	55	18	56	12	42	8	25	1	3	32	29

HAWAIIAN-NORTH EUROPEAN

Age	Low				Medium				High				Total	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	....	....	1	100	1	50	....	....	1	50	1	2
6.5	1	4	1	5	17	71	16	80	6	25	3	15	24	20
7.5	2	6	1	3	20	61	23	64	11	33	12	33	33	36
8.5	....	....	1	3	31	65	21	55	17	35	16	42	48	38
9.5	....	....	....	....	16	44	24	51	20	56	23	49	36	47
10.5	....	....	....	....	26	59	25	53	18	41	22	47	44	47
11.5	....	....	....	....	19	33	18	33	38	67	37	67	57	55
12.5	1	2	....	....	23	49	11	32	23	49	23	68	47	34
13.5	....	....	2	4	11	27	18	32	30	73	36	64	41	56
14.5	1	2	1	2	9	23	21	42	30	75	28	56	40	50
15.5	....	....	....	....	5	17	15	27	25	83	40	73	30	55
16.5	1	3	3	8	3	10	14	37	27	87	21	55	31	38
17.5	....	....	2	5	2	10	14	38	17	90	21	57	19	37
18.5	....	....	1	4	1	6	5	20	17	94	19	76	18	25
19.5	....	....	....	....	1	8	6	46	12	92	7	54	13	13
Total	6	1	12	2	185	38	232	42	291	61	309	56	482	553
Adult	4	6	6	8	25	36	44	55	41	58	29	37	70	79

TABLE L. NOSE BRIDGE, COMPARISON OF RACES

Group	Low				Medium				High				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
Hawaiian	16	6	33	12	149	57	188	67	97	37	59	21	262	280
Chinese	157	20	186	26	507	65	503	69	119	15	37	5	783	726
Japanese	233	20	263	28	798	67	646	69	159	13	29	3	1190	938
North European	1	....	....	....	98	23	95	22	323	77	328	78	422	423
South European	....	....	6	1	106	24	137	24	335	76	433	75	441	576
Korean	22	18	21	20	87	69	79	76	17	13	4	4	126	104
Haw.-Asiatic	37	12	62	17	209	65	255	68	72	23	57	15	318	374
Haw.-N. European	6	1	12	2	185	38	232	42	291	61	309	56	482	553
Haw.-S. European	6	4	6	3	74	45	85	49	83	51	83	48	163	173
Haw.-Asiatic-Eur.	4	3	8	6	65	55	92	63	50	42	45	31	119	145

TABLE LI. SEPTUM, COMPARISON OF RACES

Group	Wide				Medium				Narrow				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
Hawaiian	60	26	42	17	158	69	189	79	11	5	10	4	229	241
Chinese	92	12	70	10	623	79	595	82	69	9	60	8	784	725
Japanese	189	16	131	14	951	80	752	80	49	4	53	6	1189	936
N. European	95	23	51	12	293	69	338	80	34	8	33	8	422	422
S. European	54	13	61	11	340	80	441	80	30	7	52	9	424	554
Korean	20	16	4	4	96	75	89	86	11	9	11	10	127	104
Haw.-Asiatic	58	19	46	13	220	73	264	76	25	8	38	12	303	348
Haw.-N. European	91	20	78	15	328	70	410	78	45	10	36	7	464	524
Haw.-S. European	23	15	20	13	107	70	118	74	23	15	20	13	153	158
Haw.-Asiatic-Eur.	19	16	19	14	88	76	98	75	9	8	15	11	116	132
	Exposed				Level				Hidden					
Hawaiian	61	27	69	29	155	67	149	62	13	6	23	9	229	241
Chinese	234	30	270	37	482	62	386	54	66	8	68	9	782	724
Japanese	259	22	281	30	775	65	575	62	152	13	77	8	1186	933
N. European	144	34	162	38	265	63	252	60	12	3	8	2	421	422
S. European	184	44	300	55	222	53	239	43	14	3	12	2	420	551
Korean	23	18	20	19	102	81	79	76	1	1	5	5	126	104
Haw.-Asiatic	66	22	105	30	221	73	223	65	16	5	19	5	303	347
Haw.-N. European	115	25	178	34	330	71	333	64	18	4	10	2	463	521
Haw.-S. European	40	26	59	37	107	69	94	59	7	5	6	4	154	159
Haw.-Asiatic-Eur.	34	29	51	39	76	66	70	53	6	5	11	8	116	132

TABLE LII. AXIS OF NOSTRILS

HAWAIIAN

Age	Antero-Posterior				Oblique				Transverse				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
6.5	1	11	....	....	5	56	2	40	3	33	3	60	9	5
7.5	....	....	1	5	8	57	5	26	6	43	13	69	14	19
8.5	1	5	....	....	10	50	14	44	9	45	18	56	20	32
9.5	3	14	....	....	9	43	6	37	9	43	10	63	21	16
10.5	1	3	....	....	19	53	10	32	16	44	21	68	36	31
11.5	....	....	....	....	13	42	6	32	18	58	13	68	31	19
12.5	3	11	....	....	10	37	13	46	14	52	15	54	27	28
13.5	1	4	2	9	15	58	6	26	10	38	15	65	26	23
14.5	3	10	....	....	13	43	12	40	14	47	18	60	30	30
15.5	1	6	2	10	11	61	12	57	6	33	7	33	18	21
16.5	....	....	2	14	10	77	6	43	3	23	6	43	13	14
17.5	1	12	1	4	2	25	9	39	5	63	13	57	8	23
18.5	....	....	1	8	5	100	5	42	....	....	6	50	5	12
19.5	1	25	....	....	1	25	1	8	2	50	5	83	4	6
Total	16	6	9	3	131	50	107	38	115	44	163	59	262	279
Adult	6	3	2	1	72	41	58	39	98	56	89	60	176	149

CHINESE

Age	Antero-Posterior				Oblique				Transverse				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	....	....	3	60	6	67	2	40	3	33	5	9
6.5	5	10	1	3	25	52	27	73	18	38	9	24	48	37
7.5	3	4	4	5	46	56	38	50	33	40	34	45	82	76
8.5	4	6	5	8	42	60	30	51	24	34	24	41	70	59
9.5	....	....	3	4	37	51	34	45	36	49	38	51	73	75
10.5	4	6	1	1	38	53	36	54	29	41	30	45	71	67
11.5	1	1	5	9	38	50	24	44	37	49	25	47	76	54
12.5	2	4	2	3	35	61	38	57	20	35	27	40	57	67
13.5	3	5	3	5	38	57	32	59	25	38	20	36	66	55
14.5	4	6	4	6	32	48	35	51	31	46	30	43	67	69
15.5	5	10	5	9	30	61	19	34	14	29	32	57	49	56
16.5	3	7	3	7	17	38	19	44	25	55	21	49	45	43
17.5	1	3	3	8	12	34	24	61	22	63	12	31	35	39
18.5	10	33	....	....	9	30	7	50	11	37	7	50	30	14
19.5	1	10	....	....	5	50	5	63	4	40	3	37	10	8
Total	46	6	39	5	407	52	374	52	331	42	315	43	784	728
Adult	1	10	....	....	5	50	1	100	4	40	....	....	10	1

TABLE LII. AXIS OF NOSTRILS, *continued*

JAPANESE

Age	Antero-Posterior				Oblique				Transverse				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	....	....	....	....	1	100	....	....	....	....	....	1
6.5	4	5	5	9	43	60	32	55	25	35	21	36	72	58
7.5	7	7	11	9	72	70	72	61	24	23	35	30	103	118
8.5	7	6	10	10	76	70	57	60	26	24	29	30	109	96
9.5	9	9	11	11	63	66	52	55	24	25	33	34	96	96
10.5	12	12	10	10	58	59	63	61	29	29	30	29	99	103
11.5	10	12	15	18	54	68	55	65	16	20	14	17	80	84
12.5	8	8	12	13	71	69	55	61	24	23	23	26	103	90
13.5	10	10	6	7	61	60	62	68	30	30	23	25	101	91
14.5	10	8	11	15	75	61	48	66	38	31	14	19	123	73
15.5	12	11	11	17	66	63	42	65	27	26	12	18	105	65
16.5	19	22	5	17	48	54	19	66	21	24	5	17	88	29
17.5	15	25	2	11	31	52	14	78	14	23	2	11	60	18
18.5	9	24	2	15	20	52	4	31	9	24	7	54	38	13
19.5	5	33	1	25	6	40	1	25	4	27	2	50	15	4
Total	137	11	112	12	744	63	577	61	311	26	250	27	1192	939
Adult	3	12	1	25	13	52	3	75	9	36	....	....	25	4

NORTH EUROPEAN

Age	Antero-Posterior				Oblique				Transverse				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	1	100	3	100	....	....	....	....	....	....	....	....	1	3
6.5	17	81	13	72	4	19	5	28	....	....	....	....	21	18
7.5	23	70	21	73	10	30	7	24	....	....	1	3	33	29
8.5	28	80	26	69	5	14	10	26	2	6	2	5	35	38
9.5	36	75	25	81	12	25	5	16	....	....	1	3	48	31
10.5	43	86	25	89	6	12	3	11	1	2	....	....	50	28
11.5	37	93	19	86	3	7	3	14	....	....	....	....	40	22
12.5	29	88	34	81	4	12	8	19	....	....	....	....	33	42
13.5	35	95	39	95	2	5	2	5	....	....	....	....	37	41
14.5	37	97	48	96	....	....	2	4	1	3	....	....	38	50
15.5	36	95	39	93	2	5	3	7	....	....	....	....	38	42
16.5	23	100	35	100	....	....	....	....	....	....	....	....	23	35
17.5	15	88	26	100	2	12	....	....	....	....	....	....	17	26
18.5	4	100	13	100	....	....	....	....	....	....	....	....	4	13
19.5	6	100	5	100	....	....	....	....	....	....	....	....	6	5
Total	370	87	371	88	50	12	48	11	4	1	4	1	424	423
Adult	6	86	13	100	....	....	....	....	1	14	....	....	7	13

SOUTH EUROPEAN

Age	Antero-Posterior				Oblique				Transverse				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	....	....	....	....	1	100	....	....	....	....	....	1
6.5	15	50	13	46	13	43	12	43	2	7	3	11	30	28
7.5	28	55	26	54	21	41	20	42	2	4	2	4	51	48
8.5	16	47	22	41	17	50	28	53	1	3	3	6	34	53
9.5	23	51	34	61	21	47	18	32	1	2	4	7	45	56
10.5	28	58	33	65	18	38	16	31	2	4	2	4	48	51
11.5	32	51	30	56	19	37	18	33	1	2	6	11	52	54
12.5	31	58	41	66	21	40	18	29	1	2	3	5	53	62
13.5	21	47	47	78	23	51	12	20	1	2	1	2	45	60
14.5	18	51	43	78	15	43	11	20	2	6	1	2	35	55
15.5	12	67	29	73	5	28	10	25	1	5	1	2	18	40
16.5	6	50	17	59	6	50	12	41	....	....	....	....	12	29
17.5	6	86	17	68	1	14	8	32	....	....	....	....	7	25
18.5	3	75	4	50	1	25	4	50	....	....	....	....	4	8
19.5	1	50	4	50	1	50	3	38	....	....	1	12	2	8
Total	240	55	360	62	182	42	191	33	14	3	27	5	436	578
Adult	2	67	3	50	1	33	3	50	....	....	....	....	3	6

TABLE LII. AXIS OF NOSTRILS, *continued*

HAWAIIAN-ASIATIC

Age	Antero-Posterior				Oblique				Transverse				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	....	....	2	100	....	....	....	....	2	100	2	2
6.5	2	9	1	8	11	48	5	38	10	43	7	54	23	13
7.5	....	....	1	3	16	47	16	48	18	53	16	48	34	33
8.5	3	8	....	....	14	39	18	47	19	53	20	53	36	38
9.5	1	3	4	9	15	44	15	36	18	53	23	55	34	42
10.5	1	2	1	3	19	49	15	40	19	49	21	57	39	37
11.5	1	4	2	8	16	59	11	46	10	37	11	46	27	24
12.5	....	....	....	....	15	63	14	44	9	37	18	56	24	32
13.5	3	12	....	....	11	46	18	55	10	42	15	45	24	33
14.5	3	11	1	4	14	52	16	59	10	37	10	37	27	27
15.5	....	....	1	5	9	53	13	59	8	47	8	36	17	22
16.5	....	....	1	3	6	75	16	50	2	25	15	47	8	32
17.5	....	....	1	7	1	17	5	33	5	83	9	60	6	15
18.5	1	12	....	....	5	63	6	40	2	25	9	60	8	15
19.5	1	12	....	....	2	25	3	37	5	63	5	63	8	8
Total	16	5	13	3	156	49	171	46	145	46	189	51	317	373
Adult	1	3	....	....	22	76	13	46	6	21	15	54	29	28

HAWAIIAN-NORTH EUROPEAN

Age	Antero-Posterior				Oblique				Transverse				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	1	50	1	100	1	50	....	....	....	....	1	2
6.5	6	25	7	35	10	42	10	50	8	33	3	15	24	20
7.5	9	28	16	44	16	50	18	50	7	22	2	6	32	36
8.5	18	37	16	42	22	46	15	40	8	17	7	18	48	38
9.5	15	42	16	35	15	42	24	52	6	16	6	13	36	46
10.5	15	34	23	49	18	41	18	38	11	25	6	13	44	47
11.5	15	26	26	47	30	53	18	33	12	21	11	20	57	55
12.5	17	36	21	62	19	41	10	29	11	23	3	9	47	34
13.5	16	39	26	46	15	37	16	29	10	24	14	25	41	56
14.5	15	37	25	50	19	48	15	30	6	15	10	20	40	50
15.5	20	67	32	59	7	23	14	26	3	10	8	15	30	54
16.5	19	62	21	55	6	19	8	21	6	19	9	24	31	38
17.5	12	63	18	50	6	32	13	36	1	5	5	14	19	36
18.5	10	55	14	56	3	17	8	32	5	28	3	12	18	25
19.5	8	61	4	31	1	8	7	54	4	31	2	15	13	13
Total	195	41	266	49	188	39	195	35	98	20	89	16	481	550
Adult	23	36	22	29	32	49	42	54	10	15	13	17	65	77

TABLE LIII. AXIS OF NOSTRILS, COMPARISON OF RACES

Group	Antero-Posterior				Oblique				Transverse				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
Hawaiian	16	6	9	3	131	50	107	38	115	44	163	59	262	279
Chinese	46	6	39	5	407	52	374	52	331	42	315	43	784	728
Japanese	137	11	112	12	744	63	577	61	311	26	250	27	1192	939
N. European	370	87	371	88	50	12	48	11	4	1	4	1	424	423
S. European	240	55	360	62	182	42	191	33	14	3	27	5	436	578
Korean	14	11	18	17	75	59	54	52	38	30	32	31	127	104
Haw.-Asiatic	16	5	13	3	156	49	171	46	145	46	189	51	317	373
Haw.-N. European	195	41	266	49	188	39	195	35	98	20	89	16	481	550
Haw.-S. European	43	26	58	34	74	46	65	38	46	28	48	28	163	171
Haw.-Asiatic-Eur.	23	19	29	20	65	55	68	47	31	26	48	33	119	145

TABLE LIV. SLOPE OF THE FOREHEAD, COMPARISON OF RACES

Group	Vertical				Moderate				Totals	
	Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	No.
Hawaiian	233	90	229	83	25	10	46	17	258	275
Chinese	718	94	639	91	46	6	60	9	764	699
Japanese	998	90	754	89	107	10	91	11	1105	845
N. European	404	97	393	95	14	3	22	5	418	415
S. European	326	85	432	85	57	15	77	15	383	509
Korean	115	97	96	93	4	3	7	7	119	103
Haw.-Asiatic	285	92	295	83	24	8	62	17	309	357
Haw.-N. European	436	92	496	90	37	8	53	10	473	549
Haw.-S. European	146	93	146	89	11	7	18	11	157	164
Haw.-Asiatic-Eur.	107	92	119	89	9	8	15	11	116	134

TABLE LV. GLABELLA, COMPARISON OF RACES

Group	Smooth				Medium				Prominent				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
Hawaiian	248	95	272	98	10	4	6	2	2	1	....	....	260	278
Chinese	765	97	727	100	18	2	....	....	5	1	....	....	788	727
Japanese	1152	96	931	100	33	3	1	....	5	1	....	....	1190	932
N. European	397	94	423	100	19	5	....	....	6	1	....	....	422	423
S. European	437	99	574	100	2	1	....	....	....	....	....	....	439	574
Korean	119	93	104	100	6	6	....	....	1	1	....	....	126	104
Haw.-Asiatic	304	96	369	99	10	3	2	1	2	1	....	....	316	371
Haw.-N. European	439	91	550	99	33	7	2	1	9	2	....	....	481	552
Haw.-S. European	158	97	172	99	5	3	1	1	....	....	....	....	163	173
Haw.-Asiatic-Eur.	113	95	142	98	6	5	3	2	....	....	....	....	119	145

TABLE LVI. LIPS
HAWAIIAN

Age	Thin				Medium				Thick				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
6.5	....	....	....	....	7	78	5	100	2	22	....	....	9	5
7.5	1	7	....	....	13	93	17	89	....	....	2	11	14	19
8.5	....	....	....	....	19	95	31	97	1	5	1	3	20	32
9.5	....	....	2	13	20	95	14	87	1	5	....	....	21	16
10.5	1	3	....	....	33	92	28	90	2	5	3	10	36	31
11.5	1	3	....	....	26	84	18	95	4	13	1	5	31	19
12.5	1	4	....	....	20	71	26	93	7	25	2	7	28	28
13.5	....	....	....	....	23	88	21	95	3	12	1	5	26	22
14.5	....	....	3	10	22	73	23	80	8	27	3	10	30	29
15.5	....	....	....	....	14	78	20	91	4	22	2	9	18	22
16.5	....	....	1	7	9	82	13	86	2	18	1	7	11	15
17.5	....	....	1	4	10	100	21	92	....	....	1	4	10	23
18.5	....	....	....	....	7	100	12	100	....	....	....	....	7	12
19.5	....	....	....	....	4	80	5	100	1	20	....	....	5	5
Total	4	2	7	3	227	85	254	91	35	13	17	6	266	278
Adult	65	37	51	29	110	62	122	70	1	1	2	1	176	175

TABLE LVI. LIPS, *continued*

CHINESE

Age	Thin				Medium				Thick				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	1	20	4	44	4	80	5	56	....	....	....	....	5	9
6.5	8	17	9	24	40	83	27	73	....	....	1	3	48	37
7.5	16	20	13	17	66	80	63	83	....	....	....	....	82	76
8.5	12	17	6	10	58	83	52	88	....	....	1	2	70	59
9.5	9	12	6	8	64	88	69	92	....	....	....	....	73	75
10.5	2	3	2	3	68	97	63	94	....	....	2	3	70	67
11.5	3	4	1	2	75	95	53	96	1	1	1	2	79	55
12.5	1	2	1	2	55	96	63	94	1	2	3	4	57	67
13.5	3	5	....	....	63	95	55	100	....	....	....	....	66	55
14.5	....	....	....	....	67	100	69	100	....	....	....	....	67	69
15.5	....	....	1	2	47	96	54	96	2	4	1	2	49	56
16.5	....	....	2	5	44	98	41	95	1	2	....	....	45	43
17.5	....	....	1	3	35	100	38	97	....	....	....	....	35	39
18.5	....	....	2	17	30	100	10	83	....	....	....	....	30	12
19.5	1	10	1	13	8	80	7	87	1	10	....	....	10	8
Total	56	7	49	7	724	92	669	92	6	1	9	1	786	727
Adult	....	....	....	....	10	100	1	100	....	....	....	....	10	1

JAPANESE

Age	Thin				Medium				Totals	
	Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	1	100	....	....	....	....	....	1
6.5	20	27	19	34	52	72	37	66	73[a]	56
7.5	18	17	23	19	85	82	95	81	104[a]	118
8.5	13	12	17	18	96	87	79	82	110[a]	96
9.5	10	10	12	12	86	90	84	88	96	96
10.5	9	9	9	9	90	90	94	91	100[a]	103
11.5	7	9	1	1	74	91	84	99	81	85
12.5	3	3	3	3	100	97	87	97	103	90
13.5	2	2	3	3	100	98	88	97	102	91
14.5	1	1	1	1	119	99	72	99	120	73
15.5	2	2	1	2	103	98	64	98	105	65
16.5	....	....	....	....	88	100	29	100	88	29
17.5	....	....	....	....	60	100	17	94	60	18[a]
18.5	1	3	....	....	37	97	13	100	38	13
19.5	....	....	....	....	15	100	4	100	15	4
Total	86	7	90	10	1105	92	847	90	1195	938
Adult	....	....	....	....	25	100	4	100	25	4

[a] This total includes one case of thick lips.

KOREAN [a]

Age	Thin				Medium				Totals	
	Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	2	50	1	100	2	50	....	....	4	1
6.5	1	25	....	....	3	75	4	100	4	4
7.5	3	43	2	40	4	57	3	60	7	5
8.5	....	....	1	25	6	100	3	75	6	4
9.5	2	25	1	11	6	75	8	89	8	9
10.5	2	15	....	....	11	85	6	100	13	6
11.5	....	....	....	....	13	100	10	100	13	10
12.5	....	....	1	17	15	100	5	83	15	6
13.5	....	....	....	....	14	100	12	100	14	12
14.5	....	....	....	....	17	100	11	100	17	11
15.5	....	....	....	....	9	100	22	100	9	22
16.5	....	....	....	....	7	100	9	100	7	9
17.5	....	....	....	....	6	100	4	100	6	4
18.5	....	....	....	....	2	100	....	....	2	....
19.5	....	....	....	....	2	100	....	....	2	....
Total	10	8	6	7	117	92	97	94	127	103
Adult	....	....	....	....	5	100	....	....	5	....

[a] No thick lips were noted among the Koreans.

TABLE LVI. LIPS, *continued*

NORTH EUROPEAN [a]

Age	Thin				Medium				Totals	
	Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	....	....	1	100	3	100	1	3
6.5	5	24	6	33	16	76	12	67	21	18
7.5	8	24	4	14	25	76	25	86	33	29
8.5	3	9	5	13	32	91	33	87	35	38
9.5	6	13	3	10	42	87	28	90	48	31
10.5	10	20	1	4	40	80	27	96	50	28
11.5	6	15	2	9	34	85	20	91	40	22
12.5	2	6	1	2	31	94	41	98	33	42
13.5	3	8	3	7	34	92	38	93	37	41
14.5	3	8	4	8	35	92	46	92	38	50
15.5	1	3	6	14	37	97	36	86	38	42
16.5	1	4	1	3	22	96	34	97	23	35
17.5	3	18	3	12	14	82	23	88	17	26
18.5	1	25	1	8	3	75	12	92	4	13
19.5	1	17	1	20	5	83	4	80	6	5
Total	53	13	41	10	371	87	382	90	424	423
Adult	3	43	9	69	4	57	4	31	7	13

[a] No thick lips were recorded for the North European group.

SOUTH EUROPEAN

Age	Thin				Medium				Totals	
	Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	1	100	....	....	....	....	....	1
6.5	9	30	13	46	20	67	15	54	30[a]	28
7.5	16	31	13	26	36	69	37	74	52	50
8.5	14	38	9	17	23	62	45	83	37	54
9.5	11	24	14	25	35	76	42	75	46	56
10.5	15	31	10	20	33	69	41	80	48	51
11.5	13	24	15	28	41	76	38	70	54	54[a]
12.5	9	17	9	14	45	83	55	86	54	64
13.5	3	7	2	3	42	93	58	97	45	60
14.5	3	9	8	15	31	91	47	85	34	55
15.5	....	....	8	20	18	95	32	80	19[a]	40
16.5	....	....	6	21	12	100	23	79	12	29
17.5	....	....	9	36	7	100	16	64	7	25
18.5	....	....	4	50	3	75	4	50	4[a]	8
19.5	....	....	4	50	2	100	4	50	2	8
Total	93	21	125	22	348	78	457	78	444	583
Adult	2	67	3	50	1	33	3	50	3	6

[a] Total includes one case of thick lips.

TABLE LVII. LIPS, COMPARISON OF RACES

Group	Thin				Medium				Thick				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
Hawaiian	4	2	7	3	227	85	254	91	35	13	17	6	266	278
Chinese	56	7	49	7	724	92	669	92	6	1	9	1	786	727
Japanese	86	7	90	10	1105	92	847	90	4	1	1	....	1195	938
North European	53	13	41	10	371	87	382	90	....	....	....	....	424	423
South European	93	21	125	22	348	78	457	78	3	1	1	....	444	583
Korean	10	8	7	7	117	92	97	93	....	....	....	....	127	104
Haw.-Asiatic	13	4	5	1	286	90	345	93	18	6	24	6	317	374
Haw.-N. European	25	5	45	8	440	91	496	90	17	4	10	2	482	551
Haw.-S. European	8	5	13	8	145	89	153	88	9	6	7	4	162	173
Haw.-Asiatic-Eur.	6	5	7	5	111	93	134	92	2	2	4	3	119	145

TABLE LVIII. PROGNATHISM

HAWAIIAN

Age	None				Slight				Medium				Marked				Totals	
	Male		Female		Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
6.5	5	56	5	100	2	22	....	....	2	22	....	....	....	....	....	....	9	5
7.5	7	50	13	68	2	14	3	16	5	36	3	16	....	....	....	....	14	19
8.5	8	40	17	53	3	15	2	6	9	45	12	38	....	....	1	3	20	32
9.5	11	53	9	56	3	14	1	6	7	33	6	38	....	....	....	....	21	16
10.5	22	61	20	65	3	8	1	3	9	25	10	32	2	6	....	....	36	31
11.5	15	49	16	84	4	13	1	5	10	32	2	11	2	6	....	....	31	19
12.5	13	46	19	68	2	7	....	....	10	36	9	32	3	11	....	....	28	28
13.5	14	53	19	86	3	12	....	....	9	35	3	14	....	....	....	....	26	22
14.5	17	57	20	69	3	10	4	14	10	33	5	17	....	....	....	....	30	29
15.5	9	53	17	77	2	12	2	9	6	35	2	9	....	....	1	5	17	22
16.5	5	45	11	73	1	9	1	7	5	45	3	20	....	....	....	....	11	15
17.5	7	70	17	74	3	30	5	22	....	....	1	4	....	....	....	....	10	23
18.5	4	67	12	100	....	....	....	....	2	33	....	....	....	....	....	....	6	12
19.5	4	80	3	60	....	....	1	20	1	20	1	20	....	....	....	....	5	5
Total	141	53	198	71	31	12	21	8	85	32	57	20	7	3	2	1	264	278
Adult	138	81	123	73	14	8	23	13	19	11	23	13	....	....	1	1	171	170

CHINESE

Age	None				Slight				Medium				Marked				Totals	
	Male		Female		Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	2	40	8	89	2	40	....	....	1	20	1	11	....	....	....	....	5	9
6.5	38	79	28	76	2	4	4	11	8	17	5	13	....	....	....	....	48	37
7.5	59	72	45	59	9	11	11	15	14	17	20	26	....	....	....	....	82	76
8.5	45	64	33	56	9	13	11	19	16	23	15	25	....	....	....	....	70	59
9.5	37	50	37	49	12	16	11	15	25	34	27	36	....	....	....	....	74	75
10.5	36	51	37	55	11	15	11	16	24	34	19	29	....	....	....	....	71	67
11.5	38	49	26	47	5	6	8	15	35	45	21	38	....	....	....	....	78	55
12.5	28	49	36	54	5	9	10	15	23	40	21	31	1	2	....	....	57	67
13.5	41	62	31	56	4	6	11	20	17	26	13	24	4	6	....	....	66	55
14.5	36	54	42	61	7	10	10	15	22	33	16	23	2	3	1	1	67	69
15.5	31	63	33	59	2	4	7	12	13	27	16	29	3	6	....	....	49	56
16.5	21	47	32	74	3	6	6	14	21	47	5	12	....	....	....	....	45	43
17.5	19	54	28	72	2	6	3	8	14	40	8	20	....	....	....	....	35	39
18.5	16	53	9	75	2	7	....	....	12	40	3	25	....	....	....	....	30	12
19.5	5	50	7	100	2	20	....	....	3	30	....	....	....	....	....	....	10	7
Total	452	57	432	60	77	10	103	14	248	32	190	26	10	1	1	....	787	726
Adult	5	50	....	....	....	....	....	....	5	50	1	100	....	....	....	....	10	1

JAPANESE

Age	None				Slight				Medium				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	1	100	....	....	....	....	....	....	....	....	....	1
6.5	48	66	44	80	6	8	2	4	19	26	9	16	73	55
7.5	59	57	70	59	19	18	15	13	26	25	33	28	104	118
8.5	64	58	55	58	13	12	12	13	33	30	28	29	110	95
9.5	59	61	57	60	7	7	7	7	31	32	32	33	97	96
10.5	65	64	64	62	8	8	15	15	26	26	24	23	99	103
11.5	36	45	53	63	10	12	10	12	35	43	21	25	81	84
12.5	66	64	56	63	7	7	7	8	30	29	26	29	103	89
13.5	61	60	61	68	9	9	13	15	31	30	15	17	102[a]	89
14.5	85	71	55	75	6	5	7	10	29	24	11	15	120	73
15.5	70	66	52	80	9	9	6	9	26	25	7	11	105	65
16.5	55	62	24	83	5	6	1	3	28	32	4	14	88	29
17.5	33	55	11	61	7	12	6	33	20	33	1	6	60	18
18.5	26	68	10	77	2	5	....	....	9	24	3	23	38[a]	13
19.5	10	66	3	75	1	7	1	25	4	27	....	....	15	4
Total	735	62	616	66	109	9	102	11	347	29	214	23	1195	932
Adult	14	56	3	75	1	4	....	....	10	40	1	25	25	4

[a] Total includes one case of marked prognathism.

TABLE LIX. PROGNATHISM, COMPARISON OF RACES

Group	None				Slight				Medium				Marked				Totals	
	Male		Female		Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
Hawaiian	141	53	198	71	31	12	21	8	85	32	57	20	7	3	2	1	264	278
Chinese	452	57	432	60	77	10	103	14	248	32	190	26	10	1	1	....	787	726
Japanese	735	62	616	66	109	9	102	11	347	29	214	23	2	....	....	....	1195	932
N. European	414	98	412	97	4	1	8	2	6	1	3	1	....	....	....	....	424	423
S. European	409	93	540	93	8	2	21	4	23	5	20	3	1	....	....	....	441	581
Korean	101	79	77	74	9	7	12	12	16	13	15	14	1	1	....	....	127	104
Haw.-Asiatic	185	59	243	65	20	6	42	11	104	33	83	22	6	2	6	2	315	374
Haw.-N. European	394	82	487	88	28	6	27	5	54	11	35	6	4	1	2	1	480	551
Haw.-S. European	114	70	134	78	9	6	9	5	37	23	28	16	2	1	2	1	162	173
Haw.-Asiatic-Eur.	85	72	115	80	10	8	11	8	23	19	17	12	1	1	....	....	119	143

TABLE LX. CHIN

CHINESE

Age	Prominent				Medium				Receding				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	....	....	1	25	5	56	3	75	4	44	4	9
6.5	....	....	1	3	28	60	15	40	19	40	21	57	47	37
7.5	....	....	....	....	40	49	30	40	42	51	45	60	82	75
8.5	....	....	....	....	28	41	17	29	41	59	41	71	69	58
9.5	1	1	1	1	26	36	24	32	45	63	50	67	72	75
10.5	....	....	....	....	30	42	29	43	42	58	38	57	72	67
11.5	....	....	....	....	27	34	24	44	52	66	31	56	79	55
12.5	....	....	....	....	18	33	31	46	37	67	36	54	55	67
13.5	1	2	1	2	27	41	21	38	38	57	33	60	66	55
14.5	1	2	1	1	33	50	30	44	32	48	38	55	66	69
15.5	....	....	....	....	20	41	26	46	29	59	30	54	49	56
16.5	....	....	....	....	15	33	26	60	30	67	17	40	45	43
17.5	....	....	1	3	15	43	17	45	20	57	20	52	35	38
18.5	....	....	....	....	10	33	9	34	20	67	5	36	30	14
19.5	....	....	....	....	5	50	5	71	5	50	2	29	10	7
Total	3	1	5	1	323	41	309	43	455	58	411	56	781	725
Adult	....	....	....	....	3	33	....	....	6	67	1	100	9	1

JAPANESE

Age	Prominent				Medium				Receding				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	....	....	....	....	1	100	....	....	....	....	....	1
6.5	....	....	....	....	22	31	25	46	50	69	29	54	72	54
7.5	....	....	....	....	31	30	42	36	72	70	75	64	103	117
8.5	1	1	....	....	32	29	34	35	76	70	62	65	109	96
9.5	1	1	1	1	32	33	28	29	64	66	66	70	97	95
10.5	....	....	....	....	42	42	40	39	58	58	63	61	100	103
11.5	1	1	....	....	27	33	40	47	53	66	45	53	81	85
12.5	....	....	1	1	42	41	39	44	61	59	49	55	103	89
13.5	....	....	....	....	43	43	46	51	58	57	44	49	101	90
14.5	4	3	2	3	48	39	40	55	70	58	30	42	122	72
15.5	2	2	2	3	41	39	34	53	61	59	28	44	104	64
16.5	3	4	1	3	33	38	16	55	50	58	12	42	86	29
17.5	1	2	....	....	20	33	9	50	39	65	9	50	60	18
18.5	2	5	....	....	15	41	6	50	20	54	6	50	37	12
19.5	1	7	....	....	6	43	1	25	7	50	3	75	14	4
Total	16	1	7	1	434	37	401	43	739	62	521	56	1189	929
Adult	1	4	....	....	9	38	3	75	14	58	1	25	24	4

TABLE LX. CHIN, *continued*

NORTH EUROPEAN

Age	Prominent				Medium				Receding				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	1	100	1	33	....	....	2	67	....	....	....	....	1	3
6.5	3	16	4	22	13	68	11	61	3	16	3	17	19	18
7.5	12	36	3	10	19	58	20	69	2	6	6	21	33	29
8.5	13	37	12	31	19	54	22	58	3	9	4	11	35	38
9.5	23	48	12	39	20	42	14	45	5	10	5	16	48	31
10.5	32	64	19	68	15	30	5	18	3	6	4	14	50	28
11.5	31	77	12	54	5	13	9	41	4	10	1	5	40	22
12.5	32	97	28	67	1	3	11	26	....	....	3	7	33	42
13.5	24	65	30	73	8	22	7	17	5	13	4	10	37	41
14.5	27	71	30	60	5	13	18	36	6	16	2	4	38	50
15.5	16	42	21	51	19	50	19	47	3	8	1	2	38	41
16.5	5	22	10	28	17	74	22	63	1	4	3	9	23	35
17.5	8	47	4	15	9	53	20	77	....	....	2	8	17	26
18.5	2	50	3	23	2	50	9	69	....	....	1	8	4	13
19.5	3	50	....	....	3	50	5	100	....	....	....	....	6	5
Total	232	55	189	45	155	37	194	46	35	8	39	9	422	422
Adult	2	40	1	20	3	60	4	80	....	....	....	....	5	5

TABLE LXI. CHIN, COMPARISON OF RACES

Group	Prominent				Medium				Receding				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
Hawaiian	7	3	10	4	90	39	139	58	131	58	91	38	228	240
Chinese	3	1	5	1	323	41	309	43	455	58	411	56	781	725
Japanese	16	1	7	1	434	37	401	43	739	62	521	56	1189	929
N. European	232	55	189	45	155	37	194	46	35	8	39	9	422	422
S. European	82	19	101	18	256	61	345	63	85	20	107	19	423	553
Korean	2	1	1	1	67	53	55	53	58	46	48	46	127	104
Haw.-Asiatic	8	3	11	3	132	44	169	49	161	53	168	48	301	348
Haw.-N. European	88	19	86	16	251	54	326	62	128	27	113	22	467	525
Haw.-S. European	14	9	11	7	66	43	94	59	75	48	53	34	155	158
Haw.-Asiatic-Eur.	2	2	14	10	65	56	78	58	49	42	42	32	116	134

TABLE LXII. ROLL OF THE HELIX, COMPARISON OF RACES

Group	Rolled One-Third				Rolled Two-Thirds				Rolled Entire				Flat				Totals	
	Male		Female		Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
Hawaiian	4	5	7	7	4	5	20	19	65	86	75	73	3	4	1	1	76	103
Chinese	1	....	1	....	20	5	38	9	402	95	400	91	....	....	....	....	423	439
Japanese	2	....	2	1	69	10	62	10	637	90	534	89	1	....	....	....	709	598
N. European	....	....	1	1	3	2	2	2	127	98	109	97	....	....	....	....	130	112
S. European	5	1	7	1	19	5	40	8	369	94	477	91	....	....	....	....	393	524
Korean	....	....	....	....	1	5	2	14	19	95	12	86	....	....	....	....	20	14
Haw.-Asiatic	....	....	5	4	7	8	22	16	85	92	110	80	....	....	....	....	92	137
Haw.-N. European	3	3	8	5	15	13	14	8	95	84	149	87	....	....	....	....	113	171
Haw.-S. European	1	2	2	5	4	9	14	33	39	89	27	62	....	....	....	....	44	43
Haw.-Asiatic-Eur.	1	5	2	4	2	11	7	12	16	84	47	84	....	....	....	....	19	56

TABLE LXIII. EAR LOBE

HAWAIIAN

Age	None				Separate				Attached				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
6.5	....	....	....	....	1	50	....	....	1	50	....	....	2	....
7.5	1	20	1	25	2	40	....	....	2	40	3	75	5	4
8.5	....	....	....	....	2	50	1	17	2	50	5	83	4	6
9.5	1	50	1	20	....	....	2	40	1	50	2	40	2	5
10.5	1	13	....	....	2	25	1	17	5	62	5	83	8	6
11.5	1	25	1	17	2	50	1	17	1	25	4	66	4	6
12.5	3	33	....	....	4	44	....	....	2	22	4	100	9	4
13.5	2	22	1	20	6	67	1	20	1	11	3	60	9	5
14.5	2	33	1	7	2	34	5	33	2	33	9	60	6	15
15.5	....	....	2	17	4	57	5	42	3	43	5	41	7	12
16.5	3	38	2	20	3	37	4	40	2	25	4	40	8	10
17.5	2	50	5	42	2	50	3	25	....	....	4	33	4	12
18.5	3	75	1	10	1	25	6	60	....	....	3	30	4	10
19.5	1	50	....	....	1	50	3	75	....	....	1	25	2	4
Total	20	27	15	15	32	43	32	32	22	30	52	53	74	99
Adult	43	23	37	22	75	41	36	21	68	36	95	57	186	168

CHINESE

Age	None				Separate				Attached				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	1	25	3	37	2	50	2	25	1	25	3	37	4	8
6.5	1	3	3	10	15	44	10	33	18	53	17	57	34	30
7.5	4	7	3	6	24	43	15	30	28	50	33	64	56	51
8.5	3	7	1	3	17	39	7	21	24	54	25	76	44	33
9.5	2	4	3	7	20	42	6	13	26	54	35	80	48	44
10.5	....	....	1	2	19	46	12	26	22	54	35	72	41	48
11.5	....	....	1	4	14	27	2	8	38	73	25	88	52	28
12.5	1	3	1	2	9	25	10	20	26	72	38	78	36	49
13.5	....	....	1	4	13	39	3	11	21	61	24	85	34	28
14.5	1	4	....	....	6	22	4	12	21	74	28	88	28	32
15.5	....	....	....	....	2	13	3	14	13	87	19	86	15	22
16.5	....	....	....	....	5	42	4	25	7	58	12	75	12	16
17.5	....	....	....	....	1	33	5	32	2	67	11	68	3	16
18.5	....	....	....	....	....	....	2	25	1	100	6	75	1	8
19.5	....	....	1	33	....	....	1	33	....	....	1	33	....	3
Total	13	3	18	4	147	36	86	21	248	61	312	75	408	416

JAPANESE

Age	None				Separate				Attached				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	....	....	....	....	1	100	....	....	....	....	....	1
6.5	4	7	2	5	24	43	18	44	28	50	21	51	56	41
7.5	2	3	6	7	27	37	22	27	43	60	54	66	72	82
8.5	1	1	2	4	25	36	15	26	44	63	40	70	70	57
9.5	1	2	....	....	18	30	17	27	40	68	46	73	59	63
10.5	....	....	1	2	22	41	15	27	31	59	40	71	53	56
11.5	3	5	....	....	12	22	12	26	40	73	35	74	55	47
12.5	....	....	....	....	22	36	14	25	38	64	43	75	60	57
13.5	....	....	1	2	22	36	9	16	40	64	46	82	62	56
14.5	....	....	1	2	32	38	19	40	52	62	27	58	84	47
15.5	....	....	....	....	20	34	15	45	39	66	18	55	59	33
16.5	1	3	....	....	15	37	7	58	24	60	5	41	40	12
17.5	....	....	....	....	5	38	2	25	8	62	6	75	13	8
18.5	....	....	....	....	3	60	2	40	2	40	3	60	5	5
19.5	....	....	....	....	2	67	....	....	1	33	1	100	3	1
Total	12	2	13	2	249	36	168	30	430	62	385	68	691	566

TABLE LXIII. EAR LOBE, *continued*

NORTH EUROPEAN

Age	Separate				Attached				Totals	
	Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	No.
6.5	4	40	3	50	6	60	3	50	10	6
7.5	4	40	6	67	6	60	3	33	10	9
8.5	8	62	6	46	5	38	7	53	13	13
9.5	14	78	5	38	4	22	8	61	18	13
10.5	17	80	3	38	4	20	5	62	21	8
11.5	6	40	4	50	9	60	4	50	15	8
12.5	8	67	7	44	4	34	9	56	12	16
13.5	5	41	3	21	7	58	11	79	8	14
14.5	5	62	2	14	3	38	12	86	6	14
15.5	2	33	....	....	4	67	6	100	2	6
16.5	1	50	1	33	1	50	2	67	2	3
17.5	1	50	1	50	1	50	1	50	2	2
18.5	....	....	....	....	....	....	....	....	....	....
19.5	1	100	....	....	....	....	....	....	1	....
Total	76	58	41	37	54	42	71	63	130	112
Adult	2	100	5	45	....	....	6	55	2	11

SOUTH EUROPEAN

Age	None				Separate				Attached				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	1	100	....	....	....	....	....	....	....	....	....	1
6.5	....	....	....	....	18	64	19	73	10	36	7	27	28	26
7.5	1	2	1	2	38	80	27	58	8	18	19	40	47	47
8.5	....	....	....	....	25	73	28	54	9	27	24	46	34	52
9.5	....	....	2	4	27	64	30	64	15	36	15	32	42	47
10.5	....	....	2	4	32	71	21	45	13	29	24	51	45	47
11.5	1	2	1	2	26	57	22	49	19	41	22	49	46	45
12.5	....	....	2	3	34	72	30	52	13	28	26	45	47	58
13.5	....	....	....	....	25	61	23	43	16	39	31	57	41	54
14.5	....	....	....	....	22	76	24	49	7	24	25	51	29	49
15.5	....	....	....	....	12	75	13	48	4	25	14	52	16	27
16.5	....	....	....	....	5	71	13	62	2	29	8	38	7	21
17.5	....	....	3	15	2	67	13	65	1	33	4	20	3	20
18.5	....	....	....	....	1	100	7	100	....	....	....	....	1	7
19.5	....	....	2	25	1	100	5	63	....	....	1	13	1	8
Total	2	1	14	3	268	69	275	54	117	30	220	43	387	509
Adult	....	....	....	....	3	100	3	50	....	....	3	50	3	6

TABLE LXIV. EAR LOBE, COMPARISON OF RACES

Group	None				Separate				Attached				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
Hawaiian	20	27	15	15	32	43	32	32	22	30	52	53	74	99
Chinese	13	3	18	4	147	36	86	21	248	61	312	75	408	416
Japanese	12	2	13	2	249	36	168	30	430	62	385	68	691	566
N. European	....	....	....	....	76	58	41	37	54	42	71	63	130	112
S. European	2	1	14	3	268	69	275	54	117	30	220	43	387	509
Korean	3	15	1	7	10	50	4	18	7	35	9	65	20	14
Haw.-Asiatic	9	10	15	12	38	42	36	28	44	48	70	60	91	129
Haw.-N. European	6	5	9	6	46	41	56	34	60	54	98	60	112	163
Haw.-S. European	1	2	5	13	23	54	21	52	19	44	14	35	43	40
Haw.-Asiatic-Eur.	....	....	9	17	11	61	20	36	7	39	26	47	18	55

TABLE LXV. DARWIN'S POINT

Group	Present				Totals	
	Male		Female		Male	Female
	No.	%	No.	%	No.	No.
Hawaiian	5	8	9	10	61	94
Chinese	49	12	66	15	415	433
Japanese	51	7	69	12	698	589
N. European	13	10	16	14	130	112
S. European	27	7	57	11	381	520
Korean	....	....	3	23	19	13
Haw.-Asiatic	4	5	13	10	88	131
Haw.-N. European	9	8	9	6	110	160
Haw.-S. European	3	7	4	10	42	40
Haw.-Asiatic-Eur	1	5	6	11	19	55

TABLE LXVI. CRURA

HAWAIIAN

Age	High				Medium				Low				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
6.5	2	100	....	....	....	....	....	....	....	....	....	....	2	....
7.5	4	80	4	75	1	20	1	25	....	....	....	....	5	4
8.5	3	75	4	67	1	25	2	33	....	....	....	....	4	6
9.5	1	50	3	60	1	50	2	40	....	....	....	....	2	5
10.5	5	62	4	57	1	13	2	29	2	25	1	14	8	7
11.5	1	33	4	67	2	67	2	33	....	....	....	....	3	6
12.5	2	22	3	60	6	67	2	40	1	11	....	....	9	5
13.5	1	9	1	20	8	73	3	60	2	18	1	20	11	5
14.5	3	50	5	33	2	33	8	54	1	17	2	13	6	15
15.5	4	57	2	18	3	43	6	55	....	....	3	27	7	11
16.5	1	13	1	11	5	62	7	78	2	25	1	11	8	9
17.5	1	33	....	....	2	67	9	64	....	....	5	36	3	14
18.5	....	....	2	20	1	50	7	70	1	50	1	10	2	10
19.5	....	....	....	....	1	100	3	60	....	....	2	40	1	5
Total	28	39	32	31	34	48	54	53	9	13	16	16	71	102
Adult	2	1	9	6	83	49	71	47	86	50	71	47	171	151

CHINESE

Age	High				Medium				Low				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	3	75	3	37	1	25	3	37	....	....	2	25	4	8
6.5	19	56	19	63	15	44	8	27	....	....	3	10	34	30
7.5	45	79	37	72	9	16	9	18	3	5	5	10	57	51
8.5	30	67	22	67	10	22	8	24	5	11	3	9	45	33
9.5	32	67	36	80	11	23	8	18	5	10	1	2	48	45
10.5	28	65	29	61	10	23	17	35	5	12	2	4	43	48
11.5	33	62	26	87	18	34	3	10	2	4	1	3	53	30
12.5	22	59	36	71	15	41	13	25	....	....	2	4	37	51
13.5	23	67	21	68	7	21	9	29	4	12	1	3	34	31
14.5	21	68	21	60	8	26	14	40	2	6	....	....	31	35
15.5	10	48	15	57	8	38	9	35	3	14	2	8	21	26
16.5	8	62	7	37	3	23	11	58	2	15	1	5	13	19
17.5	1	33	2	10	2	67	17	80	....	....	2	10	3	21
18.5	....	....	1	13	1	100	7	87	....	....	....	....	1	8
19.5	....	....	....	....	....	....	1	33	....	....	2	67	....	3
Total	275	65	275	63	118	28	137	31	31	7	27	6	424	439
Adult	....	....	....	....	1	100	....	....	....	....	....	....	1	....

TABLE LXVI. CRURA, *continued*

JAPANESE

Age	High				Medium				Low				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	....	....	....	....	1	100	....	....	....	....	....	1
6.5	29	52	25	60	19	34	14	33	8	14	3	7	56	42
7.5	50	69	63	77	22	30	15	18	1	1	4	5	73	82
8.5	46	64	47	82	17	23	8	14	9	13	2	4	72	57
9.5	41	69	46	69	13	22	15	23	5	9	5	8	59	66
10.5	32	58	36	62	18	33	15	26	5	9	7	12	55	58
11.5	34	62	33	65	16	29	14	27	5	9	4	8	55	51
12.5	28	46	35	56	25	41	22	36	8	13	5	8	61	62
13.5	36	55	28	46	18	27	24	39	12	18	9	15	66	61
14.5	34	38	14	28	43	48	30	60	13	14	6	12	90	50
15.5	21	34	13	35	33	53	19	51	8	13	5	14	62	37
16.5	17	43	4	25	16	20	11	69	7	17	1	6	40	16
17.5	8	62	....	....	5	38	7	87	....	....	1	13	13	8
18.5	2	40	....	....	3	60	5	100	....	....	....	....	5	5
19.5	....	....	1	100	3	100	....	....	....	....	....	....	3	1
Total	378	53	345	58	251	35	200	33	81	12	52	9	710	597
Adult	....	....	1	25	....	....	3	75	1	100	....	....	1	4

SOUTH EUROPEAN

Age	High				Medium				Low				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
5.5	....	....	....	....	....	....	1	100	....	....	....	....	....	1
6.5	16	57	16	62	7	25	6	23	5	18	4	15	28	26
7.5	21	45	30	64	23	49	12	25	3	6	5	11	47	47
8.5	18	37	31	59	16	46	16	31	6	17	5	10	35	52
9.5	21	50	28	58	12	29	15	31	9	21	5	11	42	48
10.5	24	55	33	67	15	34	12	25	5	11	4	8	44	49
11.5	21	44	28	61	17	35	16	35	10	21	2	4	48	46
12.5	21	44	29	49	19	39	22	37	8	17	8	14	48	59
13.5	15	36	29	52	15	36	22	39	12	28	5	9	42	56
14.5	11	36	31	62	10	32	16	32	10	32	3	6	31	50
15.5	6	40	11	36	6	40	19	61	3	20	1	3	15	31
16.5	1	14	8	36	5	72	11	50	1	14	3	14	7	22
17.5	1	33	2	9	1	33	15	68	1	33	5	23	3	22
18.5	....	....	1	14	1	100	5	72	....	....	1	14	1	7
19.5	....	....	....	....	1	100	6	75	....	....	2	25	1	8
Total	171	43	277	53	148	38	194	37	73	19	53	10	392	524
Adult	....	....	....	....	1	33	6	100	2	67	....	....	3	6

TABLE LXVII. CRURA, COMPARISON OF RACES

Group	High				Medium				Low				Totals	
	Male		Female		Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
Hawaiian	28	39	32	31	34	48	54	53	9	13	16	16	71	102
Chinese	275	65	275	63	118	28	137	31	31	7	27	6	424	439
Japanese	378	53	345	58	251	35	200	33	81	12	52	9	710	597
N. European	82	63	76	68	39	30	20	18	9	7	15	14	130	111
S. European	171	43	277	53	148	38	194	37	73	19	53	10	392	524
Korean	8	40	7	50	7	35	6	43	5	25	1	7	20	14
Haw.-Asiatic	46	50	55	40	30	33	66	48	16	17	16	12	92	137
Haw.-N. European	55	48	90	53	46	41	63	37	12	11	18	10	113	171
Haw.-S. European	19	43	12	28	19	43	24	56	6	14	7	16	44	43
Haw.-Asiatic-Eur.	9	47	25	45	8	42	25	45	2	11	6	10	19	56

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DENTAL MORPHOLOGY AND PATHOLOGY OF PREHISTORIC GUAM

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Memoirs of the Bernice P. Bishop Museum
Volume XI, Number 3

WITH PLATES IV-VI

PUBLISHED BY THE MUSEUM
HONOLULU, HAWAII
1929

DENTAL MORPHOLOGY AND PATHOLOGY OF PREHISTORIC GUAM

By R. W. Leigh

INTRODUCTION

This study is based on the examination of crania from Guam in the Bernice P. Bishop Museum. I am indebted to the Director and members of the Museum staff for permission to examine the collection and for facilitating the work. The collection was made in January, 1922, by Dr. J. C. Thompson and Mr. H. G. Hornbostel, officers in the United States Navy. From the stratagraphical and cultural evidence the crania are of a pre-Spanish or early post-Spanish epoch. For the most part the skulls are a homogeneous lot, probably indicating inbreeding.

Guam, an insular possession of the United States, was discovered by Magellan in 1521. It is the principal island of the Marianas, comprising part of Micronesia. Early in the Spanish régime not only were many of the indigenous males killed, but foreign male strains were intruded—Spanish, Mexicans, Filipinos, Chinese—so that the present inhabitants, known as Chamorros, are of mixed racial origin.

The food habits, including the chewing of narcotic plants, are inextricably correlated with the dentition of any people; therefore, some notes on the food complex of the Marianans are included. The ancient Chamorros subsisted exclusively upon the flora and fauna of their island. An extensive observation on the flora and people of Guam has been made by Safford,[1] from whose work the following notes are taken. The food of the aborigines consisted of fish, some fowl, breadfruit, taro, yams, rice, bananas, coconuts. In times of scarcity nuts of *Cycas circinalis* were consumed, though they were not edible until leached and cooked. For relishes the screw pine and seaweeds were utilized. Rice was cultivated and sold, though it was regarded as a luxury and was kept for feasts. Breadfruit was cut into thin slices and dried, and in this form could be kept for a long time. Taro was not made into poi, as in Hawaii.

Fish were caught in great quantities at certain periods, dried in the sun, and stored for future consumption. Eels were not used as food. The Chamorros did not practice cannibalism; indeed, the early navigators said that they could not be induced to eat meat of any kind. Although they had pigs at a very early date it is probable that these were introduced after their discovery. The only mammals in prehistoric times were two species of bats which doubtless were not utilized as food. The Chamorros had fowls and kept doves in captivity, but there is no evidence that they ate them. Few articles of their food could be eaten raw. As was the universal custom throughout the tropical Pacific, these people cooked in pits in the earth, in which they built fires and heated stones, then made alternate layers of food, leaves, and heated stones. They did not eat to excess nor did they use wine or other intoxicating liquor. Water and the milk of unripe coconuts were their only beverages.

Of narcotics Safford [2] in another treatise says:

> The nut used is from the betel palm, *Areca catechu*, a part of the nut is wrapped with a few leaves of betel pepper, *Piper betle*, and the whole sprinkled with a pinch of lime, the latter secured by burning coral. The betel thus prepared has an agreeable aromatic pungency, not unlike that of nutmeg. It imparts a fragrance to the breath, which is not disagreeable, but it discolors the teeth in time and causes them to crumble away, while the constant expectoration of saliva, red like blood, is a disagreeable habit. The aborigines were remarkably free from disease and physical defects, and lived to a great age.

The betel juice is the active agent in the production of the red color which stains the saliva and mouth of the betel chewer; the color may be readily obtained by mixing the betel nut and lime in rain water. It has a marked stimulant effect. The quid is habitually held in the buccal recess—between teeth and cheek. Safford[3] writes that "every native carried a finely woven bag of *Pan-*

[1] Safford, W. E., Useful plants of the island of Guam: U. S. Nat. Herbarium, Contributions, vol. 9, 1905.

[2] Safford, W. E., Guam and its people: Smithsonian Inst., Ann. Rept. for 1902, Washington, 1903.

[3] op. cit., p. 98.

danus matting containing betel nut." The custom of betel chewing was universal, and has survived to the present day, though the habit is now less popular. There are many references to the habit, a succinct example from Freycinet's[4] voyage is: "The complexion of both sexes is a dark yellow. Their teeth are in general spoiled by the use of betel, and the lime with which they season it."

The habit of betel chewing, as well as many other cultural elements, spread from India to Malaysia and the Pacific. The Chamorros were not far removed from the Philippines where betel chewing, blackening and mutilating the teeth are practiced. These practices are evidenced in this collection. Kroeber[5] states:

> The overwhelming majority of Philippine tribes agreed with their kinsmen of the East Indies in filing and blackening the teeth. . . . Betel is chewed. It irritates the gums, turns the saliva blood red, and blackens the teeth. The essential element is the nut of the areca palm, which is sliced, sprinkled with lime, and wrapped in a leaf of buyo.

An interesting comparison of this Oriental narcotic habit with the use of narcotic plants mixed with lime by other primitive peoples is pertinent. Safford[6] again is authority:

> Specimens of *Erythroxylon coca* were found in coca bags suspended from necks of Peruvian mummies. All were accompanied by small gourds containing lime, and a spatula by means of which the lime was dipped out. In place of lime, wood ashes were sometimes used. The use of lime or ashes to set free the alkaloid contained in the leaves recalls the same custom in connection with the betel of Asia, the piptadenia snuff, and green tobacco of the Aztecs. That its efficiency should have been independently discovered by the primitive inhabitants of such widely separated regions is remarkable.

Kroeber[7] describes an analogous habit of mixing lime with a narcotic as practiced in aboriginal California, where tobacco, which was cultivated, was mixed in small mortars with lime obtained by burning mussel shells. This mixture was chewed or made into a concoction and swallowed. This habit may have been derived remotely from Mexico. These narcotic-lime chewing habits are evidently authentic cases of cultural parallelism. Comparison of the dentitions of crania from these diverse regions shows betel chewing to result in far greater deleterious effects on the teeth than do the other narcotic-lime habits: permanent discoloration and heavy lime accretions with resultant pathological processes are produced (p. 268). Safford's remark that the habit causes the teeth "to crumble away" should not be taken literally.

MORPHOLOGY

Physical anthropology embraces the study of racial anatomy, physiology, and pathology. Hrdlička defines physical anthropology as the study of man's variation. Dental anatomy, comprising both maxillae and teeth, varies considerably in the human races. The comparative study of anatomical features is properly referred to as morphology. Many features of the dentition may be observed for comparative purposes; in this study but a few have been selected, some standardized measurements, others, such as the enamel line at the cervix, comparatively recent observations.

CERVICAL ENAMEL LINE

The marginal line of the enamel on post-cuspid teeth of most Caucasians pursues a fairly horizontal course around the cervix. I have described[8] a marked deviation from this regular course on the teeth of several American tribes: the enamel streams into the radical bifurcation, both facially and lingually, to an acute point; and on some there is even a marked root-wise extension of the enamel on single-rooted premolars. On the molars of the Eskimo there is frequently a detached enamel pearl nestled in the bifurcation about 1 mm. beyond the acute point of the marginal line. Chappel[9] has shown that 94 per cent of Hawaiian skulls examined by him evidence some indication of enamel extension. From these observations it would appear that this morphological feature is worthy of note for comparative purposes.

On the teeth of this Mongoloid tribe I found the enamel streaming into the bifurcations particularly of the inferior second and third molars, but to a shorter distance than with the Americans. I found few enamel pearls. The degree to which the enamel extended root-wise was arbitrarily classified as follows and per cent of occurrence noted: marked, 4; medium, 16; slight, 62; ab-

[4] Arago, J., Narrative of a voyage round the world made by Captain Freycinet in 1817, p. 260, London, 1823.

[5] Kroeber, A. L., Peoples of the Philippines: Am. Mus. Nat. Hist., Handbook Ser., no. 8, New York, 1919.

[6] Safford, W. E., Narcotic plants and stimulants of the ancient Americans: Smithsonian Inst., Ann. Rept. for 1916, 1917.

[7] Kroeber, A. L., Handbook of the Indians of California: Bur. Am. Ethnology, Bull. 78, 1925.

[8] Leigh, R. W., Dental pathology of aboriginal California: Univ. California, Publ. Am. Arch. Ethnology, vol. 23, pp. 399-440, 1928.

[9] Chappel, H. G., Jaws and teeth of ancient Hawaiians: B. P. Bishop Mus., Mem., vol. 9, no. 3, 1927.

sent, 18. Thus 82 per cent of the Chamorro crania evidence a root-wise extension of the cervical enamel line.

HORIZONTAL ENAMEL GROOVES

A peculiar feature of these teeth is a corrugation of the enamel on the facial aspect of the superior premolars and molars, more constant on the molars. At first I considered the feature a variant of hypoplastic enamel of individual significance only; but upon closer inspection the structure of the enamel appears sound, without faults or atypical pigmentation. The feature is most often obscured by the stain and lime accretions concomitant with betel-nut chewing. The corrugation consists of a horizontal, rounded, unfaulted groove at about the vertical center of the crown with more or less of a bulging ridge above and below. No. 760 presents a good example of this corrugation on the superior first and second molars. This feature is so constant throughout the group that I am forced to conclude: corrugation of the facial aspect of the enamel of the superior molars is a morphological character. In some skulls on both superior and inferior molars there are roundish nodules on the cervical border of the enamel as well as the grooves and elevations. This is a fairly common feature and is exemplified in No. 662.

MARGINAL RIDGES OF INCISORS

The marginal ridges on the lingual aspect of the superior central and lateral incisors vary in prominence with racial groups. In anthropological literature this character is referred to as the shovel-shaped teeth of Hrdlička. Dr. Hrdlička found the superior incisors of the American Indian to be characterized by triangular fossae on their lingual aspect, formed by convex elevated marginal ridges and cingulum. Sullivan[10] has featured this dental character under the following classification: absent, slight, medium, marked. The marginal ridges of the incisors of this Mongoloid tribe were not prominent; Table I summarizes the occurrence of this character:

TABLE I. MARGINAL RIDGES OF INCISORS.

	PER CENT			
	Absent	Slight	Medium	Marked
Central	84	12	4	0
Lateral	72	8	17	3

[10] Sullivan, L. R., Essentials of anthropometry: Am. Mus. Nat. Hist., New York, 1923.

CUSPS

The cusp pattern of molars is a feature which has a distinct bearing on racial relationship. The dentition of lower races of mankind differs from that of the higher in that the cusp pattern is constant in the lower races: the superior molars are quadricuspid, the inferior quinquecuspid; thus the cusp formula for the lower races tends to be $\frac{4\text{-}4\text{-}4}{5\text{-}5\text{-}5}$. In modern Caucasians the superior third molar varies widely in cusp form; the inferior second molar usually has but four cusps; but the inferior third molar varies. Due to both antemortem and postmortem loss of teeth such morphological features cannot be observed in the total number of crania studied.

Frequently there are accessory cusps, which are possibly more distinctive of the higher races. One such accessory cusp has a fairly distinct form and location; namely, on the lingual aspect of the mesiolingual cusp of the superior first molar. This coalesced element is known as the accessory cusp or tubercle of Carabelli. In the group of 106 crania the first molars were observable in 89; and the tuberculus anomalus was present in approximately 12 per cent. Its occurrence was bilateral on the first molars in eight skulls, unilateral in two; and bilateral on the second molar in one. Of the 11 individuals 8 were females, 3 males.

The cusp form of the inferior second molar merits separate note in the somatological study of any racial group. In the Chamorros it is quadricuspid in 81 per cent, and tends to be quinquecuspid in 19 per cent. Table II gives the complete data.

TABLE II. CUSPS ON M_2.

	Cusps		Skulls	Per Cent
	4		66	81
	4.5		4	5
	5		11	14
Mean	4	Total	81	100

The number of cusps on all molars present was recorded. The superior third molar is the most variable; the inferior first molar is constant. From the data in Table III, it is apparent that the cusp formula for this group tends to be $\frac{4\text{-}4\text{-}4}{5\text{-}4\text{-}4}$.

TABLE III. CUSPS ON MOLARS.

Molar	M^1	M^2	M^3		M_1	M_2	M_3
Crania	88	88	46		82	81	56
Cusps			Per	Cent			
5			7		100	14	34
4.5	10		2			5	5
4	90	69	30			81	59
3.5		22[a]	30				
3		8	20				
2.5		1	2				
2			9				

[a] One with additional Carabelli's cusp.

TABLE IV. DIMINUTIVE TEETH.

Superior		Inferior	
Third molar	7		
	Small		
Third molar	7	Third molar	2
Second molar	2	Second molar	2

ATYPICAL TEETH

With regard to variability in the number of teeth in the arch only one supernumerary was observed. No. 646, male, has a supernumerary dental element unerupted in the right palatal process 1 cm. distal of anterior palatine foramen. The first molars have Carabelli's cusps. There was one case of agenesia of the inferior lateral incisors.

There is an unmistakable tendency to diminution in size of the superior third molar; and the abnormally small teeth are lost earlier in life with a complete healing in of the alveolus, otherwise Table IV would show a greater number. In No. 509 these molars are mere abortive vestiges. Table IV shows this diminutive tendency of the superior third molar without a similar tendency to reduction of the inferior third; indeed, there is evidence of much disharmony in size and form of these two members of the series. The superior molar was lost frequently without untoward result to the individual, and apparently was tending to disappear in this race; while the inferior molar retained its cusp form and size with frequent impactions (Occlusion, p. 260) and pathological processes ensuing.

Other than the exceptions noted, the teeth of this group are average or smaller in size. The roots of large teeth tend to be bifurcated, and impactions occur resultant from incongruity in size of mandible and teeth. Conspicuous examples are listed in Table V.

TABLE V. LARGE TEETH.

Mus. No.	Sex	Size	Miscellaneous
477	Male	Large	M_3 impacted, bilateral
529	Male	Large	Bifurcated roots, Simian jaws
614	Male	Large	
646	Male	Broad incisors	Bifurcations, supernumerary element
770	Male	Large	Malocclusion
763	Male	Broad incisors	M_3 impacted, unilateral

As observed by Jones [11] relative to the general features of these skulls, there is homogeneity of the dentitions. Variation in size and form is the exception. Anomalous conditions of the roots, such as deeply grooved, bifurcated, and additional roots, observed are given in Table VI. Mutilation of the specimens or radiography doubtless would reveal others. No. 529 has atypical jaws and dentition: large teeth; primitive cusp formula, $\frac{4\text{-}4\text{-}4}{5\text{-}5\text{-}5}$; bifurcation of roots of superior second premolar and distal root of inferior first molar; three roots to the inferior first premolar; roughened areas of insertion of muscles of mastication; and squarish, rugged mandible and maxillae. These features may indicate reversion to an earlier phylogenetic type, or possibly mark this individual as an intruder; but his food and narcotic habits had been those of the group.

TABLE VI. ACCESSORY ROOTS.

Mus. No.	Sex	Teeth	Anomaly	Miscellaneous
529	Male	Pm^2, Pm_1, M_1	Pm^2, M_1 bif., Pm_1 3 roots	Rugged, Simian jaws
639	Male	M^3, bilateral	Four roots	
644	Female	M^1, M^2	Additional lingual root	
646	Male	M_1, Pm_2, Pm_1	Dis. r. bif., grooved, bif.	Broad teeth, ovoid arch
679	Male	I^1 right	Bifurcation line from cingulum to apex	

OCCLUSION

The Chamorros, though of Mongoloid stock, are characterized by facial prognathism (*v. infra*, gnathic index); but this facial protrusion is in

[11] Jones, F. W., Unpublished manuscript.

part apparent only due to a procumbency of the anterior part of the arches, sub-nasal prognathism; rather than real facial prognathism wherein the lower part of the face protrudes beyond a vertical line dropped from the forehead. The anterior teeth are inclined labially in ample, fan-like, symmetrical curves, which gives a Negroid fullness to the oral region. The incisors are not of spatulate form, nor the posterior teeth bell-shaped. There are no congenital diastema distal to the inferior cuspids. The incisors of adults have an edge-to-edge occlusion in most of these specimens; this arrangement may be considered the occlusal norm for the group. No. 509 is illustrative. The areas of origin and insertion of the muscles of mastication are generally but slightly roughened, indicating a rather weak masticatory musculature; the genial tubercles are ill defined. Their food was cooked and soft.

Malocclusion, Class I (Angle), wherein one or more teeth are not in harmony with the line of occlusion, occurs in 15 per cent of these skulls. Impactions of inferior third molars are included. Table VII gives the number of times the respective teeth are involved.

TABLE VII. MALOCCLUSION.

Superior		Inferior	
Third molar	2	Third molar	14
Second molar	1	Second molar	1
Second premolar	1	First premolar	2
Frist premolar	1	Cuspid	1
Incisors	8	Incisors	2
Total	13		20

MENTAL FORAMEN

The location and bilateral symmetry of the mental foramina vary with the races of mankind. This foramen is located just below the vertical center of the body of the mandible and antero-posteriorly anywhere from between the premolars to the apex of the mesial root of the first molar. Its usual position is in alignment with the second premolar. In this racial group there is asymmetry of location on the two sides in 12.8 per cent; in 5 per cent there are accessory foramina of equal or smaller size than the normal opening.

TABLE VIII. MENTAL FORAMEN.

86 Mandibles	Per Cent		
Location	Right	Left	Average
Between Pm_1 and Pm_2	9	7	8
Below Pm_2	79	77	78
Between Pm_2 and M_1	8	12	10
Below mesial root M_1	4	4	4

Simonton [12] made a study of the location of the mental foramen in several widely differing groups of human crania as well as in anthropoid apes. He found a general tendency for the foramen to lie in line with Pm_2. Melanesians were exceptions to this rule, the most constant position for them was between Pm_2 and mesial root of M_1. He found multiple foramina in 6 per cent of Caucasians, 11 per cent of Melanesians, 16 per cent of Negroes, and 15 per cent of Chimpanzees.

CRANIOMETRY

The following standardized craniometric measurements were made in accordance with the definitions and technique outlined in Hrdlička's "Anthropometry"[13]: (A) Skull—prosthion-alveolon and alveolar width from which the maxillo-alveolar index is calculated; basion-prosthion and basion-nasion from which the gnathic index is calculated; dental length, that is the distance from the mesial surface of Pm^1 to distal of M^3, teeth in situ; from this and the basion-nasion, the dental index is calculated. (B) Mandible—symphysial height, height of body, minimum width of ramus, height of sigmoid notch, and bigonial width.

TABLE IX. RÉSUMÉ OF MAXILLARY MEASUREMENTS.

	Average		Minimum		Maximum		Skulls	
	M	F	M	F	M	F	M	F
Prosthion-alveolon	53.5	50.5	46	42	60	57	(42)	(44)
Alveolar width	66.7	63.6	61	57	73	70		
Maxillo-alveolar index	125.4	126.1	110.9	114	144.6	138.3		
Basion-prosthion	100.3	96.4	92	87	112	107	(37)	(35)
Basion-nasion	102.1	96.9	95	90	111	110		
Gnathic index	98.3	99.5	91.5	90.6	107.3	106.4		
Dental length	43.1 (8)		40		47			
Dental index	42.6		39.8		47			

[12] Simonton, F. V., Mental foramen in man and anthropoid apes: Am. Jour. Phys. Anthropology, vol. 6, no. 4, 1923.
[13] Hrdlička, Aleš, Anthropometry, Philadelphia, 1920.

TABLE X. RANGE OF MANDIBULAR MEASUREMENTS.

	Average		Minimum		Maximum	
Males (41) Females (42)	M	F	M	F	M	F
Symphysial height	31.8	30.4	30	22	36	39
Height of body—right	28.3	27.4	28	24	33	34
Height of body—left	28.8	27.2	27	23	33	33
Width of ramus, minimum—r.	38.2	36.6	33	32	43	43
Width of ramus, minimum—l.	38.7	36.3	34	31	45	42
Height of sigmoid notch—r.	50.7	46.2	44	42	59	54
Height of sigmoid notch—l.	50.	45.7	43	40	58	54
Bigonial width	109.4	102.4	99	92	124	114

BILATERAL SYMMETRY (PER CENT)

	M	F
Height of body	31.7	48.5
Width of ramus-minimum	36.5	38.
Height of sigmoid notch	39.	35.7
Average	35.7	40.7

TABLE XI. CLASSIFICATION OF INDICES.

	Males		Females	
Maxillo-alveolar index	No.	Per Cent	No.	Per Cent
Dolichouranic	0	0	0	0
Mesuranic	2	4.8	2	4.5
Brachyuranic	40	95.2	42	95.5
	42	100	44	100
Gnathic index				
Orthognathous	20	54	21	60
Mesognathous	14	37.9	10	28.6
Prognathous	3	8.1	4	11.4
	37	100	35	100

TABLE XII. SEXUAL FACTOR IN GNATHIC INDEX.

Gnathic index	Average	Prognathous	Per Cent
Females	99.5 (35)	Females	11.4
Males	98.3 (37)	Males	8.1
Difference	1.2	Difference	3.3

TABLE XIII. MAXILLARY MEASUREMENTS—MALES (42).

Mus. No.	Age	Prosthion-Alveolon	Alveolar Width	Maxillo-Alveolar Index	Basion-Prosthion	Basion-Nasion	Gnathic Index	Miscellaneous
461	40	53	68	128.3	97	104	93.3	T. incl. lingually
620	40	52	64	123.	97	106	91.5	
465	....	....	....	.....	99	105	94.3	
697	....	....	....	.....	92	97	94.8	
740	45	55	61	110.9				Heavy
735	65	52	64	123.	96	101	95.0	Alveoloclasia
666	50	51	67	131.3	97	102	95.1	Alveoloclasia
607a	40	52	64	123.0	98	103	95.1	
607c	65	51	65	127.4	96	101	95.0	
457	55	51	70	137.2	100	105	95.2	
491	....	....	....	.....	101	106	95.3	
652	60	58	70	120.6	105	110	95.5	
660	25	52	66	126.9	101	105	96.2	
679	40	51	70	137.2	101	105	96.2	I^1 bifurcated
602	65	54	66	122.2	101	105	96.2	M^3 erupting
696	....	....	....	.....	100	104	96.2	
666	55	51	65	127.4	105	109	96.3	Alveoloclasia
733	65	50	64	128.0	100	104	96.2	Alveoloclasia
524	....	....	....	.....	93	96	96.9	
672	40	55	69	125.4	100	102	98.	
655	50	53	67	126.4	101	103	98.1	Alveoloclasia
468	50	50	63	126.0	94	95	98.9	
476	....	....	....	.....	99	101	98	
694	....	....	....	.....	107	108	99.1	
700	....	....	....	.....	106	107	99.1	
489	....	....	....	.....	98	98	100.	
601	35	59	69	116.9	112	111	100.9	
639	40	60	73	121.6	108	107	100.9	M^3 atypical
646	40	55	67	121.8	108	107	100.9	Supernumerary
702	....	....	....	.....	103	102	101.	
490	....	....	....	.....	103	101	102.	
716	45	53	64	120.7	100	98	102.	
734	40	54	65	120.3	103	101	102.	
1136	....	....	....	.....	103	100	103	
730	60	56	70	125.0	103	100	103	
688	50	54	67	124.0	98	95	103.2	
705	40	58	71	122.4	108	101	106.9	
685	30	57	68	119.3	103	96	107.3	
452	50	56	71	126.7				
441	35	56	69	123.2				
723	50	55	64	116.3				
716	40	55	65	118.1				
529	40	56	71	126.7				Ac. bifurcations
750	40	50	61	122.0				
754	55	48	66	137.5				
763	35	56	72	128.5				

TABLE XIII. MAXILLARY MEASUREMENTS—MALES (42).—continued.

MUS. NO.	AGE	PROSTHION-ALVEOLON	ALVEOLAR WIDTH	MAXILLO-ALVEOLAR INDEX	BASION-PROSTHION	BASION-NASION	GNATHIC INDEX	MISCELLANEOUS
617	40	47	68	144.6				Yaws lesions
614	55	60	67	111.6				Large teeth
632	40	46	63	136.9				Yaws lesions
683	40	57	67	135.0				M^3 diminutive
684	40	51	61	119.6				M^2 Carabelli
662	55	52	65	125.0				Pm^1 atypical
770	16	58	68	117.2				Large teeth
729	70	47	67	142.7				Senile atrophy

TABLE XIV. MAXILLARY MEASUREMENTS—FEMALE (44).

MUS. NO.	AGE	PROSTHION-ALVEOLON	ALVEOLAR WIDTH	MAXILLO-ALVEOLAR INDEX	BASION-PROSTHION	BASION-NASION	GNATHIC INDEX	MISCELLANEOUS
656	30	48	59	122.9	87	96	90.6	
609	50	47	61	129.7	91	98	92.8	
675	65	48	57	118.7	90	97	92.8	Senile
647	50	51	67	131.3	95	101	94.1	
634	45	48	60	125.0	93	98	94.9	
644	65	51	64	125.5	94	99	94.9	Senile
671	50	49	64	132.6	94	99	95.	Accretions
720	65	50	63	126.0	92	97	94.8	
725	50	55	68	123.6	103	108	95.4	
613	25	45	61	135.5	87	91	95.6	
664	65	49	63	128.5	91	95	95.8	
657	55	47	63	134.0	93	97	95.9	
732	35	49	65	132.6	96	100	96.	
680	40	50	63	126.0	94	97	96.9	
608	40	47	61	129.8	98	101	97.	
442	18	50	69	138.0	96	99	97.	
640	18	51	62	121.5	101	104	97.1	
731	35	53	67	126.4	107	110	97.3	
643	25	50	61	122.0	91	93	97.8	
719	30	48	58	120.8	89	91	97.8	
736	18	48	64	133.3	98	100	98.	
663	40	49	61	124.4	96	97	99.	
519	....	....	....	.....	95	96	99.	
669	....	....	....	.....	98	98	100.	
1141	....	....	....	.....	96	96	100.	
623	16	47	59	125.5	90	90	100.	
728	35	51	63	123.5	99	99	100.	
518	....	....	....	.....	97	96	101.	
717	18	53	69	130.1	105	104	101.	
527	30	54	66	122.2	101	99	102.	
460	60	57	65	114.0	104	101	103.	
453	50	57	67	117.5	107	103	103.9	
458	30	52	69	132.6	100	96	104.2	
650	35	52	61	117.3	98	93	105.4	Narrow arch
615	20	57	67	117.5	100	94	106.4	
711	40	52	64	123.0	....	....	.....	
640	18	51	62	121.5	....	....	.....	
717	18	54	70	129.6	....	....	.....	
734	35	55	65	118.1	....	....	.....	
526	35	53	62	116.9	....	....	.....	
751	25	50	63	126.0	....	...	.....	
753	25	52	67	128.8	....	....	.....	
749	14	50	62	124.0	....	....	.....	
1042	35	47	65	138.3	....	....	.....	
766	20	51	63	123.5	....	....	.....	
626	14	48	63	131.2	....	....	.....	
615	20	57	67	117.5	....	....	.....	Edentulous
659	70	42	48	114.	....	....	....	
727	40	47	59	125.5	....	....	.....	

TABLE XV. MANDIBULAR MEASUREMENTS—MALES (41).

MUS. NO.	AGE	SYM-PHYSIAL HEIGHT	HEIGHT OF BODY R	HEIGHT OF BODY L	WIDTH RAMUS, MINIMUM R	WIDTH RAMUS, MINIMUM L	HEIGHT SIGMOID R	HEIGHT SIGMOID L	BIGONIAL WIDTH	MISCELLANEOUS
629	65	27	27	26	39	38	42	42	92	Senile resorption
685	30	34	30	29	38	38	51	51	99	
468	50	35	31	31	33	....	54	....	100	Large
607	65	....	....	....	37	39	54	52	101	Senile resorption
641	65	29	29	28	37	39	48	48	102	Senile resorption
646	40	35	31	33	39	39	48	48	104	Bifurcated roots
683	40	32	29	30	38	38	55	56	105	M_3 impacted
632	40	29	28	28	39	39	44	41	104	Yaws lesion
754	55	28	27	24	39	35	48	43	104	Asymmetrical
750	40	33	25	25	34	34	44	43	105	
457	55	30	31	30	41	....	55	....	105	
770	16	31	25	26	42	40	46	48	105	Sub-adult
679	40	....	28	26	38	40	49	52	106	
607a	40	34	27	28	36	38	50	49	107	
723	50	30	28	28	38	38	48	44	108	Alveolar resorption
740	45	34	32	32	34*a*	34	52	52	108	Heavy, angular
763	35	34	32	30	39	40	59	55	109	Broad incisors
666	50	29	26	27	41	42	51	51	109	Alveolar resorption
662	55	30	29	26	36	40	49	48	109	I_2 Agenesia
655	50	31	26	28	38	40	49	51	109	Alveolar resorption
729	70	28	30	30	38	37	51	52	109	Senile resorption
652	60	27	23	26	40	37	55	56	110	Alveolar resorption
441	35	33	28	30	40	....	52	....	111	
161	40	33	28	30	40	....	52	51	111	
672	40	34	31	29	37	38	58	57	111	
734	40	32	27	27	40	38	45	44	111	
666	55	28	28	28	40	44	54	55	112	Alveolar resorption
477	50	30	29	29	38	38	50	50	113	Resorp. symphysis
705	40	35	29	31	40	40	49	49	113	
617	40	28	28	29	34	36	52	52	114	Resorp. symphysis
614	55	34	32	32	43	45	56	58	114	M_2 Alveolar resorp.
620	40	32	26	27	35	37	47	47	115	
716	45	34	28	29	35	37	52	50	115	
735	65	34	28	28	41	40	48	48	115	Alveolar resorption
601	35	36	31	33	36	38	51	53	117	M_2 Alveolar resorp.
730	60	30	23	28	41	40	46	44	117	Alveolar resorption
529	40	34	33	32	43	43	51	52	118	Heavy, bif. roots
716	40	34	32	32	35	37	52	50	124	
602	65	....	25	24	36	36	45	45	....	Senile resorption
658	20	33	29	28	39	....	53	....	....	
733	65	30	28	28	38	39	51	50	....	Alveolar resorption

[a] Maximum: R 50, L 52.

TABLE XVI. MANDIBULAR MEASUREMENTS—FEMALES (42).

MUS. NO.	AGE	SYM-PHYSIAL HEIGHT	HEIGHT OF BODY R	HEIGHT OF BODY L	WIDTH RAMUS, MINIMUM R	WIDTH RAMUS, MINIMUM L	HEIGHT OF SIGMOID R	HEIGHT OF SIGMOID L	BIGONIAL WIDTH	MISCELLANEOUS
613	25	27	25	24	31	31	50	48	89	
650	35	27	26	26	38	37	47	47	89	Narrow
664	65	24	24	27	34	35	45	44	92	Alveoloclasia
634	45	26	24	23	33	34	44	40	93	
615	20	32	26	26	35	35	47	45	94	
526	35	30	28	28	36	36	47	47	95	
626	14	32	26	26	31	30	37	40	95	Child
623	16	30	25	25	32	33	43	44	95	Sub-adult, typical
609	50	29	27	24	32	31	44	45	97	
728	35	31	28	27	34	36	46	46	97	
643	25	30	24	26	33	33	44	44	98	
659	70	20	14	18	34	34	44	43	98	Edentulous
647	50	25	23	25	40	38	43	42	98	Alveoloclasia
644	65	26	22	21	35	34	46	46	99	Senile
663	40	34	29	29	32	33	43	43	99	
479	18	28	26	26	36	37	45	45	100	Sub-adult
608	40	30	26	26	32	33	46	45	100	
732	35	29	26	26	35	35	45	42	100	
458	30	33	26	27	38	....	44	....	101	
657	55	22	27	23	34	32	48	49	101	
727	40	29	26	24	34	34	42	44	103	
640	18	32	28	27	39	....	47	....	104	Sub-adult
766	20	30	26	25	38	38	42	43	104	
463	18	33	28	....	35	....	51	....	106	Sub-adult
759	20	39	34	33	43	42	47	46	106	
717	18	34	28	28	39	38	48	49	107	Sub-adult
751	25	34	33	33	33	36	44	42	107	
725	50	30	32	30	43	42	51	50	108	
739	60	29	27	26	39	38	47	46	109	
453	50	36	33	32	42	....	52	....	110	
711	40	34	31	32	40	....	54	....	112	Angular
609	35	33	28	28	43	....	47	....	112	
651	35	28	28	28	37	36	45	47	112	
734	35	32	28	27	40	38	45	44	113	
731	35	33	30	31	41	41	54	54	114	Large
478	35	33	26	....	33	....	45	....	....	
1042	35	30	28	28	38	....	42	....	....	
762	17	....	....	29	36	....	....	54	....	
761	50	30	....	26	....	38	....	42	....	
656	30	25	23	24	32	....	....	41	....	
717	20	34	28	28	38	39	49	48	....	
736	18	28	27	27	38	38	50	49	....	

DENTAL INDEX

M^3 is missing from the dentition of many skulls through noneruption, antemortem or postmortem loss; therefore, it was impracticable to secure extensive data for determining the dental index. When present M^3 is frequently diminutive, always small; and M^2 is rather small. It may be said that in this group M^3 is distinctly degenerate to the verge of suppression; it is an abortive vestige of the normal size and morphology in many races. The dental length and index are thus reduced; the average index is 42.6, the group tends to be mesodont. There is, however, a considerable sexual difference, the dental length of males is longer than that of females. The soft diet of Micronesia may have tended to reduction of tooth size; as posited by Duckworth,[14] reduction in size of teeth is attendant upon civilization, and directly upon diet and preparation of food.

MAXILLO-ALVEOLAR INDEX

The alveolar width, the maximum spread outside the second molars, is in every specimen from 10 to 40 per cent greater than the palate length, from prosthion to alveolon. The palate is short, broad, and the dental arch extremely roundish. This breadth of the alveolus together with a broad spread of the zygomae and narrowness of the cranium in the temporal region, give these crania a resemblance to those of the Eskimo. Popular descriptions of the early Chamorros characterize them as being tall, muscular, light bronze in color, with high cheek bones and heavy jaws. It is probable this skeletal material is of their forbears. The mean maxillo-alveolar index for males is 125.4, maximum 144.6. Ninety-five per cent of the group have an index of 115 and over, brachyuranic. This character is illustrative of the great homogeneity in the group: in an insular habitat there was doubtless considerable inbreeding.

GNATHIC INDEX

The gnathic index shows a considerable range of variation: 90.6 to 107.3, average 98.9. The average is well within the mesognathous class; but Table XI shows 54 per cent of males and 60 per cent of females to be orthognathous; and 8 and 11 per cent respectively, prognathous. The greater the index, the greater is the projection of the jaw, and consequently the more ape-like is the countenance. Apparently there is a correlation between the gnathic index and size of M^3: in the orthognathous skulls, M^3 is usually either diminutive or missing; No. 509 is an exception. Many of the crania, particularly females, present an apparent prognathism; this is largely sub-nasal between the akanthion and prosthion, affecting the anterior portion of the superior maxillae: the incisors are inclined labially giving a Negroid fullness to the oral region. The data seem to point to a slight sexual factor in the gnathic index which is displayed in Table XII. Relative to a sexual factor in the gnathic index, W. L. H. Duckworth[15] says that no important differences have been observed in the skulls of Europeans, though there is indication of more pronounced maxillary projection in female crania. It is more pronounced in Australians, as given by Flower:[16] females 103.1 (33), males 100.4 (73), difference 2.7. Guam shows a difference of 1.2; there are also more prognathous females. The female thus tends to be more prognathous.

MANDIBLE

Mandibular measurements are given in Table X. In harmony with the wide rounded dental arches, the average bigonial width is fairly wide. There are well defined sexual differences in the mandibular dimensions which are in consonance with many other cranial sexual characters. Marked asymmetry of the two sides is detailed in the table. The mandibles are fairly large, the mental and incisive regions are prominent; the incisors are well forward and occlude with the superior incisors in an edge-to-edge relation, prosharmosis, and the extent of interdigitation of the superior and inferior premolars and molars is much less than in the normal occlusion of Caucasians. M_3 is more often present than M^3, and is not so greatly reduced in size nor changed in form; but consequently is frequently impacted.

PATHOLOGY

ETHNIC DEFORMATION

Intentional mutilation of the dentition, while not a pathological process, may conveniently be considered in this section. Frequently untoward tissue changes ensue secondary to artificial destruction or deformation. Ethnic dental deformation assumes various forms with different prim-

[14] Duckworth, W. L. H., Morphology and anthropology, Cambridge, 1915.

[15] Duckworth, W. L. H., Morphology and anthropology, Cambridge, 1915.

[16] Flower, W. H., Catalogue of the Museum of the Royal College of Surgeons, London. 1879.

itive people: staining or blackening, filing in diverse ways, forceful extraction of one or more teeth as exemplified by the Hawaiian mourning custom.[17]

The facial surfaces of the anterior twelve to fourteen teeth of the Chamorros are discolored, the shade varying from orange to blackish brown. Though there is evidence that this stain was sometimes applied purposefully, in the main it was incidental to the betel-chewing habit which is considered separately. Nos. 463 and 458, females, as well as others, present evidence that the staining was purposeful, only surfaces exposed to view are stained. Safford [18] says, "Their teeth were stained black for the sake of ornament, and they bleached their hair with divers washes." Females as young as 16 years evidence the discoloration; 9 female children and sub-adults had unstained teeth; but the teeth of all adult females are stained. There appear no differences between the sexes with regard to shade of discoloration, about one-fourth of both have the orange hue. Staining of the teeth may have been an adolescent or betrothal rite. Japanese women upon betrothal formerly blackened the anterior teeth.

The Chamorros had another definite ethnic mode of dental mutilation practiced by a few individuals: the labial surfaces of the superior anterior six teeth were marred by filing a diagonal cross-section design well into the enamel. Lips of potsherds and other artifacts recovered from the same burials as this skeletal material are decorated with this device, indicating a well established ethnic pattern. No. 481, female, age about 45, displays this deformation plainly. There are other fragmentary maxillae with teeth similarly mutilated. Due particularly to postmortem loss of the superior anterior six teeth, the smooth conical shape of the roots is responsible for many of these teeth dropping from their alveoli, other cases are not available. The origin or significance of this lattice design dental deformation is not known.

BETEL STAINING

The arresting feature of the teeth of the Chamorros is the discoloration from betel nut chewing. The facial surfaces of the anterior 12 to 14 teeth, as well as the lingual surfaces of the superior incisors and cuspids, are permanently discolored. Other than children, only six adult males had unstained teeth; these persons were probably ascetics. The pigment is seldom distal to the mesial third of the first molars. Attritional enamel facets on the incisal edges, occlusal and approximating surfaces are unstained; and seldom has the stain penetrated exposed dentinal tubuli as it does in the teeth of modern tobacco chewers. There is little stain in the grooves of the occlusal surfaces; nor is there any appreciable discoloration of the lingual surfaces save on the superior anterior six or eight teeth. No. 711 is a typical example.

Factors limiting the discoloration evidently were trituration of food, frictional influence of tongue, and dilution of saliva. Near the orifices of the salivary ducts the enamel presents unstained surfaces. The discoloration was limited cervically by the height of the investing soft tissue. The distribution of the stain and the clean facets exclude the possibility of the stain being a postmortem organic contamination. The testimony of early voyagers as well as contemporary observers in southern Asia and the southeast Pacific confirm betel chewing as the cause. This widely distributed habit of the Orient was deeply entrenched socially; the habit was interwoven with niceties of social intercourse. Both socially and physiologically betel nut chewing is strongly habit-forming. Some of the desired effects on the habitué were: stimulation by the active principle of the betel nut, *aracaine*, a poisonous alkaloid not unlike nicotine and possessing powerful properties for destroying tapeworms; as a digestive, or comparable to the after dinner effect of tobacco; and, particularly with women, the wanted vermilion of lips and tongue. This custom of lavishly tinting the lips with the pigment of the betel nut concoction is probably a convergent cultural trait to the world-spread custom of application of rouge to the lips by females. The quid was not so much triturated as it was held in the facial vestibule: continued action was sought, and with older individuals the material was retained until quite completely dissolved. The habitual location of the quid and purposeful coloration of the lips largely accounts for the distribution of stain on the facial surfaces of the teeth.

Intact, sound enamel *per se* is unstainable.[19] Sec-

[17] Chappel, H. G., Jaws and teeth of ancient Hawaiians: B. P. Bishop Mus., Mem., vol. 9, no. 3, 1927.

[18] Safford, W. E., Guam and its people: Smithsonian Inst., Ann. Rept. for 1902, Washington, 1903.

[19] Leigh, R. W., Staining of human enamel in bulk: American Dental Assoc., Jour., vol. 12, no. 12, 1925.

tion of the facial enamel of the Chamorros' teeth shows the stain to have penetrated but a fractional part of its thickness. This superficial impregnation of the enamel could not have occurred without superficial partial decalcification of this dense inorganic tissue, thus producing shallow interstices between the enamel rods into which the coloring and other organic material was precipitated. Dr. Panchanan Mitra, an Indian anthropologist, informs me that in India in addition to the usually listed components of the preparation, slice of Areca nut, lime, and pepper leaf, there is added the juice of a certain tree which is acid in reaction and contains a very soluble reddish pigment. Some similar plant juice, markedly acid in reaction, must have been used in Guam, which etched the enamel and made possible the permanent inclusion of the organic pigment. While vermilion lips have been universally the vogue, discolored teeth in modern times have become increasingly less desirable in Micronesia and elsewhere in the Orient, and efforts are made to cleanse the discolored enamel by means of rubbing with fibrous twigs often sprinkled with fine beach sand. Other than the disfigurement and a slight etching of the facial enamel, this tissue did not succumb to the betel nut habit.

LIME ACCRETIONS

The excretion of calcium and other salts in the saliva is a physiological process which varies with metabolism. The dissolved salts upon contact with the air tend to precipitate on the surfaces of teeth in the proximity of the orifices of the salivary ducts; namely, upon the lingual surfaces of the inferior incisors and the facial surface of the superior first molar. Friction of tongue and food, particularly if fibrous and requiring vigorous mastication, reduces adhesion of these precipitates. Artificial cleansing with fibrous plants or brush is more positive. Betel nut chewers are subjected to additional deposits from this source. The teeth of individuals in this collection under thirty-five years of age are quite free from extraneous deposits; but with advancing years the lime accretions become increasingly larger, particularly on the facial surfaces of the molars. The lingual surfaces of the inferior incisors are free of deposits in practically all skulls; this is in contrast to the condition prevailing on these teeth in the mouths of modern people. It would appear that the locus of the deposits is determined in part by the habitual position of the betel nut quid in the buccal vestibule. On some dentitions, such as Nos. 666 and 671, the accretions are enormous. The deposits overlay discolored enamel, the discoloration in most of the skulls having occurred at about puberty. If the natural physiological processes served to prevent deposits in those younger than middle age without the use of artificial means, it is evident that those beyond 35 years were not as vigorous in their masticatory habits, nor did they have recourse to artificial methods of cleaning. But their diet was soft and cooked, it required but little masticatory function; and the lime-containing betel-nut concoction directly produced excessive lime accretions on the facial surfaces of the molar teeth. The lime accretions accompany and are parallel to degenerative changes in the osseous support of the teeth; and it seems a justifiable inference that these accretions, together with other active irritants, have directly produced marginal inflammation of the investing tissues. No. 664 is typical of these conditions.

PERIODONTOCLASIA

Periodontoclasia is a chronic destructive degeneration of the investing tissues of teeth which eventuates in exfoliation. Alveoloclasia is the breaking down of the alveolar wall. This only can be observed on skeletal material. There is a gradual recession of the alveolar crest from childhood to late adult life even with well preserved dentitions which may be considered free from alveoloclasia. The distance from enamel margin to alveolar crest gradually increases; this increase, in effect, is a continued physiological eruption of the teeth. The distance from enamel border to crest of alveolus at the mesio-facial angle of the superior and inferior first molars in such skulls was measured. Appreciable deviations in the height of the alveolar process from the norms given in Table XVII, together with resorption of septal and intra-alveolar bone, are pathologic. The alveolar process investing the inferior molar is heavier, and, in most skulls, approaches the enamel border closer than the process supporting the superior molar. The texture and thickness of the alveolar process of males, in this group, is more rugged than that of females; and there are no females beyond middle life with well-preserved alveolar processes.

TABLE XVII. NORMAL HEIGHT OF ALVEOLAR CREST.

MALES				FEMALES			
MUS. NO.	AGE	M^1 mm.	M_1 mm.	MUS. NO.	AGE	M^1 mm.	M_1 mm.
770	18	1	1	610	9	0	0
658	25	2	2	626	14	1	1
685	30	2	1	640	18	1	1
441	35	2	2	615	20	1	1
716	40	2	1	631	20	2	1
529	40	3	2	643	25	2	1
620	40	1	2	467	30	3	1
716	45	3	1	728	35	2	1
740	45	4	3	509	35	3	1.5
468	50	3	2	732	35	2	2
453	50	2	3	663	40	4	2

Periodontoclasia, premature loss of teeth through degenerative changes in the supporting tissues, is the pathologic process of highest incidence with these people. The onset of the lesion was rare under 35 years; all females over 40 had one or more teeth involved; while 66 per cent of males beyond 35 years had well marked lesions at decease. Determinants of this sexual difference are: heavier, stronger osseous structure of males; more vigorous functioning of the dentition of males; females, possibly for cosmetic purposes, were more uniformly addicted to the betel nut habit than were males. The ancient male Chamorros were reputed to be tall, muscular, and with high cheek bones and heavy jaws.

Table XVIII shows the incidence of the lesion to be highest with the third molar, progressively less with the second and first molars, and much less with the antemolar teeth, save the inferior incisors of males. A higher per cent of all anterior teeth of males than of females were involved. Various stages of resorption of the alveolar support are present in the group; and as the resorption approaches the apex, exfoliation is the inevitable result. Table XIX gives teeth lost antemortem, and as periodontoclasia was the major cause, there is a strong correlation between Tables XVIII and XIX.

Etiologically, the following conditions may be considered: (a) irritation of the investing tissues by betel nut chewing, both the immediate and repeated effect of the concoction on the soft tissues, and constant chronic inflammation produced by fixed lime accretions; (b) the soft monotonous diet requiring little resistant mastication, and probably deficient in such essentials as antiscorbutic vitamin; (c) generally, a high susceptibility to periodontal infection and degeneration determined by hereditary, dietary, sedentary, and climatic factors. High susceptibility to periodontal disease by a people living in a similar habitat to that of the Chamorros, is exemplified in the Filipinos, who are subject to virulent detructive parietal abscesses with resultant loss of teeth. Periodontal degeneration is a concomitant of betel nut chewing throughout the Orient as vouched by many competent observers; and this skeletal material indicates its positive local rôle in causation.

No person under thirty had lost any teeth at decease; this is a remarkably favorable dental condition in contrast with that of modern Caucasians. Sixty-four per cent of those older than 30 years had lost one or more teeth; but Table XIX indicates that in many skulls the third molars only were missing. There were four edentulous males and one female. Periodontoclasia caused the loss of nearly all; caries, attrition, "gangosa," traumatism, a few each.

TABLE XIX. TEETH LOST ANTEMORTEM
53 INDIVIDUALS, ABSOLUTE PER CENT.

M^3	66	M_3	51
M^2	13	M_2	13
M^1	11	M_1	10
Pm^2	9	Pm_2	5
Pm^1	12	Pm_1	11
C	6	C	12
I^2	19	I_2	28
I^1	18	I_1	30

TABLE XVIII. TEETH INVOLVED IN ALVEOLOCLASIA.

MALES, 31 SKULLS PER CENT				FEMALES, 21 SKULLS PER CENT			
M^3	69	M_3	65	M^3	69	M_3	55
M^2	46	M_2	48	M^2	66	M_2	35
M^1	42	M_1	45	M^1	52	M_1	33
Pm^2	38	Pm_2	21	Pm^2	29	Pm_2	16
Pm^1	35	Pm_1	24	Pm^1	19	Pm_1	14
C	26	C	29	C	7	C	9
I^2	22	I_2	40	I^2	14	I_2	19
I^1	22	I_1	43	I^1	17	I_1	21

CARIES

Dental caries is a molecular decalcification and disintegration of the hard parts of the teeth: it is initiated on the surface and extends pulpward, and is bacterial in character. In this group of 106 skulls, 19, or 18 per cent, have one more carious teeth. Of the 19 individuals, 3 were young adults, 5 of middle age, and 11 old persons. The old persons had typical senile carious lesions having their initiation at the cervix beyond the protective enamel. There are 42 carious teeth, and 60 per cent of these are of the senile type. Of the cavities 40 per cent are localized in pits on occlusal and facial surfaces of molars and premolars. Five of the 19 cases have six periapical osseous lesions resultant from pulp exposure through the caries process.

In these crania there are not a few molars and premolars having deep occlusal grooves at the bottom of which are fissures, faults in the coalescence of the separate lobes, or irregular pits, yet entirely free from caries. Thus a defective or hypoplastic tooth is not necessarily symptomatic of caries; but the specific environmental cause of caries must exist before either a sound or hypoplastic tooth will succumb to this decalcifying process. The freedom of children and youth in this race from caries is in sharp contrast to the incidence in modern people; and the comparative immunity until middle life is comparable to the occurrence of caries in the old Hawaiians.[20]

TABLE XX. LOCALIZATION OF CARIES.

SUPERIOR	PER CENT OF CAVITIES	INFERIOR	PER CENT OF CAVITIES
Third molar	9.5	Third molar	2.4
Second molar	26.2	Second molar	21.4
First molar	4.8	First molar	9.5
Second premolar	2.4	Second premolar	4.8
First premolar	2.4	First premolar	4.8
Cuspid	7.0	Cuspid	0.
Second incisor	4.8	Second incisor	0.
First incisor	0.	First incisor	0.
	57.1		42.9

SURFACE ON WHICH INITIATED	CAVITIES	PER CENT
Pits in occlusal and facial of molars and premolars	17	40.5
Cervix-facial, mesial, distal (senile type)	25	59.5
	42	100

ATTRITION

Attrition is the gradual wearing away of the hard parts of the teeth through the physical and physiological agencies of mastication of food and narcotics. Attrition is common to most primitive peoples; it was of extensive pathological significance in aboriginal California[21]. The degree of wear may range from slight enamel facets to pulp exposure with its pernicious sequelae. The plane of wear on the inferior teeth slants obtusely from the linguo-occlusal angle toward the bucco-cervical margin of the enamel; the plane of wear on the superior teeth is the reverse thereof. Extensive attrition exposing the dental pulp is a concomitant of senility with some races. The betel nut concoction, especially because of its lime content, has an abrasive effect on the teeth, but not nearly so great as may be imagined as the habit was to hold the bolus in the buccal vestibule rather than to actively chew it. No abrasives apparently were introduced in the preparation of the soft cooked food. Individuals in this group under 25 years showed very slight wear; those under 40 but little; while 7 old individuals had teeth worn to exposure of the pulp, fourth degree attrition, with 19 periapical osseous lesions resultant.

TRAUMATISM

Fracture of teeth constitutes an appreciable amount of dental pathology especially with primitive races. Combat and use of the dentition as tools are responsible for this painful injury. Fracture causing immediate exposure of the pulp, or continued irritation though not frankly exposed, results in its necrosis and microbic invasion of the periapical tissues with permanent chronic osteitis or abscess. Seven per cent of this group had fractured teeth; of 12 teeth fractured, 7 had caused pulp necrosis and periapical osteitis. There was one case of a healed fractured mandible.

PERIAPICAL OSTEITIS

Pulp exposure from any cause is followed in course by its infection and necrosis with subsequent chronic infection via the apical foramina of the periapical tissues. This infection ordinarily produces a proliferating periodontitis and limited osteitis. There may or may not be a fistula leading to the oral cavity. Sixteen per cent of these skulls evidence chronic periapical osteitis. Table XXI gives the primary causes. With modern people caries is the usual cause of periapical lesions.

[20] Chappel, H. G., Jaws and teeth of ancient Hawaiians: B. P. Bishop Mus., Mem., vol. 9, no. 3, 1927.

[21] Leigh, R. W., Dental pathology of aboriginal California: Univ. California, Publ., Am. Arch. Ethnology, vol. 23, pp. 399-440, 1928.

TABLE XXI. PERIAPICAL OSTEITIS.

SKULLS	PRIMARY CAUSE	LESIONS	PER CENT
7	Attrition	19	59.4
4	Fracture	7	21.8
6	Caries	6	18.8

PARADENTAL LESIONS

Impacted lower third molars were provocative of marked osseous disturbance. Through resorption of surrounding bone the organism attempted to erupt, resorb, or cast off these non-erupted teeth; the reaction is somewhat similar to that stimulated by a foreign body. In 11 impactions, lesions from 1 to 3 cm. in diameter occur; Nos. 683 and 477 are examples. In several not only is there extensive resorption of bone but also resorption of the opposing distal wall of the second molar to the point of pulp exposure with its necrosis and resultant periapical lesion. Thus reduction in jaw size is accompanied by aberrant eruption and severe pathological processes.

No. 663 has a lesion about 1 cm. in diameter buccally of Pm^1, probably due to a foreign body or retained deciduous root. No dental cysts were observed in the series. Neither are there any cases of chronic sinusitis of dental origin as may occur with fistula leading from periapical lesion into the maxillary sinus.

Several skulls have extensive eroded lesions in the palate and nose, with sunken saddle-shaped nasal bones; some have old lesions in the outer table of the calvarium. These lesions are not unlike those of tertiary syphilis. No. 617 has extensive lesions of the palate, vomer and turbinates and sunken nasal bones. No. 632 has an aperture 1 cm. in diameter in floor of left naris with smooth, well-rounded margin continuous with lingual plate of alveolar process, the left incisors having been lost through the necrosis, and the vomer and turbinates have been largely destroyed. The etiology of these lesions was probably yaws, a syphilitic-like disease, or what is known as "gangosa." Spanish or Oriental origin of this disease would help establish the antiquity of this skeletal material.

SUMMARY

The ancient inhabitants of Guam subsisted exclusively upon the flora and fauna of their insular habitat. Their food consisted of fish, some fowl, breadfruit, taro, yams, rice, bananas, coconuts; screw pine and seaweeds served as relishes. Breadfruit and fish were dried and stored. As throughout the tropical Pacific, they cooked in pits in the earth with heated stones. They did not eat to excess nor did they use fermented beverages.

Betel nut was the narcotic to which they were strongly addicted; this is a cultural trait of wide Oriental distribution. The nut used is from the betel palm, *Areca catechu*; a part of the nut is wrapped with a few leaves of betel pepper, *Piper betle*, and the whole sprinkled with a pinch of lime, the latter secured by burning coral. A potent alkaloid, *aracaine*, is liberated by aid of the lime; this has a marked stimulant effect. The betel juice also produces a soluble red pigment which colors the saliva, lips and mouth a rich red, and gradually but permanently discolors the teeth.

Some morphological features of note are: The cervical margin of the enamel streams into the bifurcations, particularly of the inferior second and third molars terminating in an acute point; occasionally beyond this point a detached enamel pearl is found. This feature is absent in Caucasians; more prominent in many American tribes than in the collection studied.

A peculiar feature of these teeth is a corrugation of the enamel on the buccal aspect of the superior premolars and molars. It consists of a horizontal, rounded, unfaulted, groove with a low ridge above and below it. The cervical ridge may be interpreted by some as a cingulum.

Marginal ridges on the lingual aspect of the superior incisors are not prominent in this series, being present in moderate degree only on some twenty per cent.

The cusp formula of this group tends to be:

$$\frac{4\text{-}4\text{-}4}{5\text{-}4\text{-}4}.$$

The inferior first molar is constant; the inferior second molar is quadricuspid in eighty per cent; the superior third molar is the most variable. Such a cusp formula is not indicative of a primitive race. There is a decided tendency to diminution in size of the superior third molar; in many skulls it is a mere abortive vestige; frequently it is not erupted. There are some males with large angular jaws, large teeth with accessory roots.

The normal occlusion is characterized by a slight procumbency of the incisors with attendant edge-to-edge occlusion, and sight interdigitation of the posterior teeth, prosharmosis. The mastica-

tory musculature was weak. Malocclusion occurred in 15 per cent; impaction of inferior third molars was frequent.

The mental foramen was below Pm_2 in about 80 per cent.

The palate is short, broad and roundish; 95 per cent are brachyuranic. The average dental index is 42.6, the group tends to be mesodont. The average gnathic index is 98.9, mesognathous. Many of the crania, particularly females, present an apparent prognathism; this is sub-nasal, between the akanthion and prosthion, giving a Negroid fullness to the oral region. There are marked sexual differences in the group; otherwise homogeneity characterizes it. The somatological characters herein described point unmistakably to Mongoloid affiliations.

The teeth of these prehistoric inhabitants of Guam are well formed; but 5 per cent evidence slight developmental disturbance. Ethnic deformation was practiced to a limited extent by filing a lattice design on the facial surfaces of the six superior anterior teeth; staining the teeth an orange to black color was customary.

Betel nut chewing was universal, its deleterious effects on the dentition were: permanent discoloration of the enamel on the facial surfaces particularly; and predisposing the investing dental tissues to degeneration. The betel nut concoction because of its lime content produced enormous accretions on the teeth, which, through impingement on the gingivae and alveolar process, produced chronic irritation and inflammation. The repeated and long continued action of the narcotic bolus furthered the chronic inflammatory process.

The betel nut habit together with a soft diet requiring but little mastication were the primary factors in producing a high incidence of periodontoclasia, chronic destructive degeneration of the investing tissues of the teeth which eventuates in exfoliation. Practically all females and 65 per cent of males beyond 40 years had teeth involved by periodontal disease. The third molars were affected most frequently. No person under 30 years had lost any teeth at decease; periodontoclasia was the major cause of loss in later life.

Dental caries occurs in 18 per cent of skulls. Periapical lesions are evident in 16 per cent, secondary to caries, attrition, and fracture. Impacted third molars caused extensive disturbance of the tissues. Serious lesions of the palate and nose of some skulls were evidently resultant from yaws.

EXPLANATION OF PLATES

PLATE IV

Skulls from Guam: *A*, no. 631, female young adult about twenty-five years old. Typical cranium and jaws; subnasal prognathism; occlusion is of the prosharmosis form: little or no overlapping of the superior teeth, slight interdigitation of posterior teeth. M^3 is small and erupting malposed. Facial surfaces of antemolar teeth have been stained with betel nut, the white cervical border was covered by the gingivae in the living. *B*, no. 662, female of about forty years. Subnasal prognathism, occlusion prosharmosis. Betel staining, accretions and alveoloclasia. *C*, no. 615, female twenty years old, profile of typical female, gnathic index 106; edge-to-edge occlusion, prosharmosis. The third molars show in their crypts. Betel nut chewing has discolored facial surfaces of 12 teeth; lingual surfaces of maxillary anterior teeth, but the lingual surfaces of mandibular teeth are unstained, and but little on occlusal surfaces; this is the usual distribution of stain. *D*, no. 453, male about fifty years old. Gnathic index 105. Betel staining, second degree attrition, ^2PM carious crown and parietal abscess; PM^2, not shown, fractured.

PLATE V

Maxillae from Guam: *A*, no. 529, male, about forty years old. Occlusal aspect of jaws showing alveoli from which teeth have been lost postmortem. The arches are short, broad and roundish, the maxillo-alveolar index is 126.7; the jaws are rugged and of primitive features. All premolars have bifurcated roots, inferior first premolars are trifurcated, distal root of M_1 bifurcated. Cusp formula: $\frac{4\text{-}4\text{-}3.5}{5\text{-}5\text{-}5}$ *B*, no. 529, lateral aspect of mandible shown in Plate V, *A*. It is thick, rugged, simian-like. There are no lesions; the individual was a betel chewer. *C*, no. 509, female, thirty-five years of age. Palate is roundish; narrow teeth. M^3 is an abortive vestige, ^3M lost antemortem also extremely abortive. Betel chewer, but little stain on lingual and occlusal surfaces of teeth. *D*, no. 646, male, forty years of age. Parabolic arch; broad anterior teeth; molars decrease in size successively backward. Supernumerary dental element nonerupted in palate. ^2PM fractured buccal cusp, periapical osteitis with fistula opening on plate resultant. *E*, no. 463, female, subadult. $_3M$ and M_3 both slightly impacted. No lesions. Facial surfaces of 12 anterior teeth stained light brown, no stain on occlusal or lingual surfaces, staining probably purposeful, possibly a betrothal rite.

PLATE VI

Skull and jaws from Guam: *A*, no. 632, skull of a man about forty years old. Extensive lesions of nose and maxilla simulating tertiary syphilis, probably caused by yaws: vomer, turbinates, walls of antra, and alveolar and palatal processes about incisors eroded, loss on left incisors resultant. Dark betel staining, heavy lime accretions, alveoloclasia resultant from betel chewing. *B*, no. 481, right half of maxilla of female, about forty-five years. Ethnic mutilation of the anterior maxillary eight teeth: A lattice design is filed into the enamel. Betel staining, ^1PM has fourth degree attrition on occlusal aspect, not shown in this photograph, with resultant periapical osteitis. *C*, no. 740, mandible of male, about forty years of age. Large angular mandible: $_3M$ impacted. Dark discoloration and heavy accretions resultant from betel chewing.

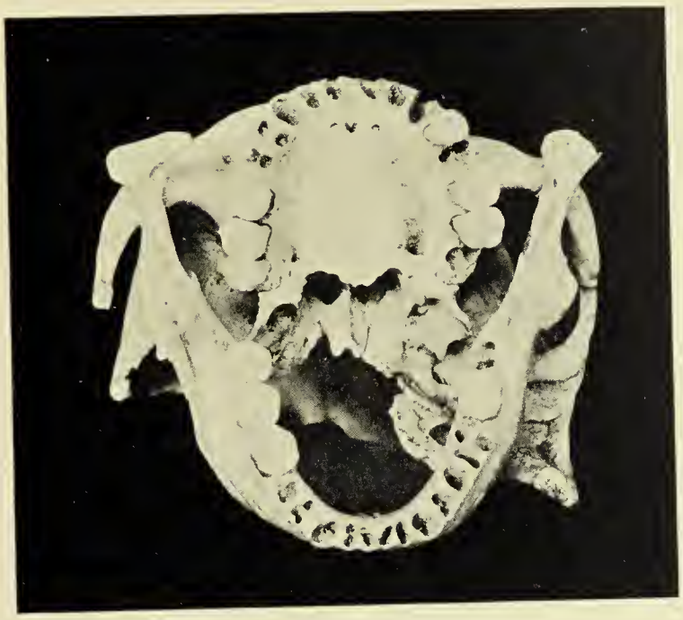
A

B

C

D

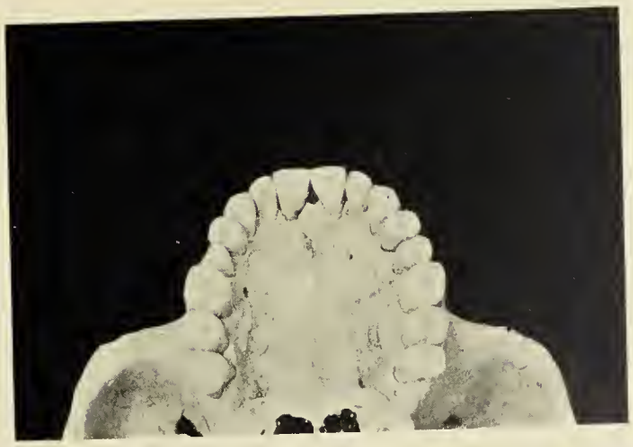
SKULLS FROM GUAM



A

B

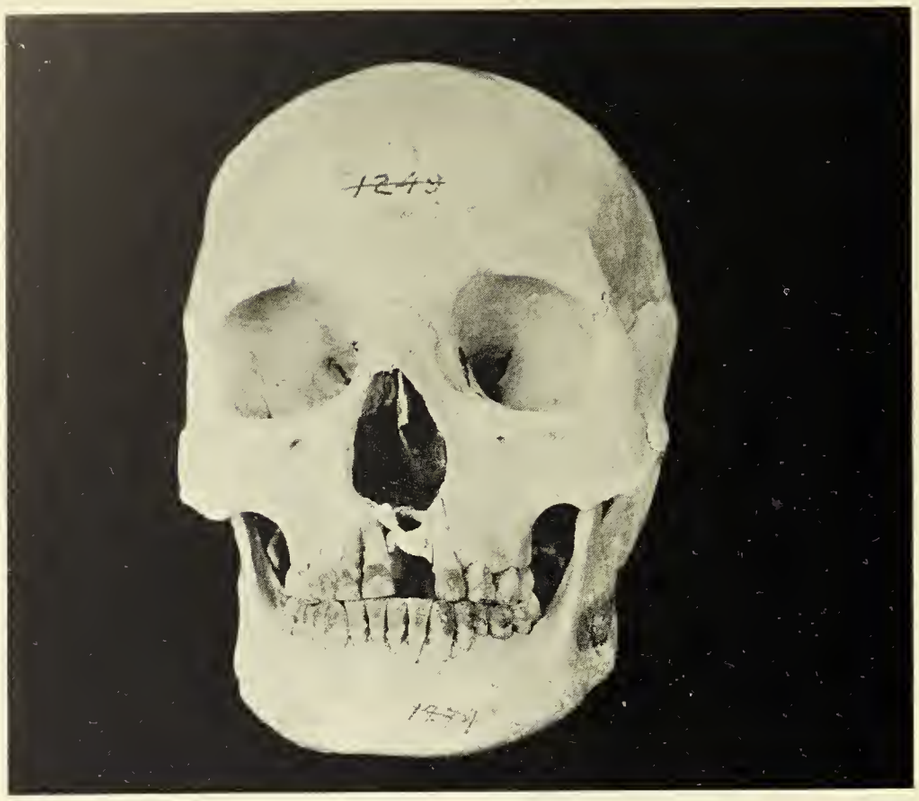
C



D

E

MAXILAE FROM GUAM



A

B

C

SKULL AND JAWS FROM GUAM

THE PHYSICAL CHARACTERS OF THE SOCIETY ISLANDERS

By H. L. Shapiro

BASED ON FIELD RECORDS BY E. S. CRAIGHILL HANDY AND WILLOWDEAN C. HANDY

Memoirs of the Bernice P. Bishop Museum
Volume XI, Number 4

With Plates vii-x

HONOLULU, HAWAII
Published by the Museum
1930

KRAUS REPRINT CO.
Millwood, New York
1974

Reprinted with the permission of the Bishop Museum Press
KRAUS REPRINT CO.
A U.S. Division of Kraus-Thomson Organization Limited

Printed in U.S.A.

THE PHYSICAL CHARACTERS OF THE SOCIETY ISLANDERS

By H. L. Shapiro

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INTRODUCTION

SCOPE AND PURPOSE

As part of the work of the Bayard Dominick Expedition, a series of papers on the physical anthropology of the Polynesians was initiated by the late Louis R. Sullivan. The present study is one of that series which now includes contributions to the somatology of the Samoans, Tongans, Hawaiians, and Society Islanders. As a result of this increased interest and activity, adequate data will soon be available for an estimate of the racial composition of the Polynesian people.

This paper on the physical characteristics of the Society Islanders is based on the field records obtained by E. S. Craighill Handy and Willowdean C. Handy in the summer of 1923. I have also used a small series of Tahitians collected by John F. G. Stokes in 1922. My aim has been to present the data simply, leaving to a later study a more detailed analysis.

My thanks are due to Dr. and Mrs. Handy and to Mr. Stokes for the use of their valuable material. I wish also to thank Dr. Herbert E. Gregory, Director of Bernice P. Bishop Museum, for his encouragement of these studies and for his consistent interest in the progress of this work. To Miss Bella Weitzner I am deeply indebted for assistance in the preparation of the manuscript.

METHOD

The anthropometric technique employed is in accordance with the International Agreement. It is not possible, however, to eliminate the personal equation which is involved in the various studies in the series. But aside from this, the measurements given here are as comparable as it is usually possible to obtain.

The following measurements were taken:

1. Stature
2. Shoulder Height
3. Middle Finger Height
4. Sitting Height
5. Span
6. Head Length
7. Head Width
8. Minimum Frontal Diameter
9. Face Width
10. Bigonial Diameter
11. Face Height
12. Nose Height
13. Nose Width
14. Ear Height
15. Ear Width

By subtraction according to the projective technique:

16. Arm Length
17. Leg Length
18. Trunk Length

The following indices:

1. Cephalic
2. Fronto-Parietal
3. Cephalo-Facial
4. Zygomatico-Frontal
5. Zygomatico-Gonial
6. Facial
7. Nasal
8. Ear
9. Relative Shoulder Height
10. Relative Arm Length
11. Relative Leg Length
12. Relative Sitting Height
13. Relative Span
14. Relative Trunk Length
15. Arm-Leg

In addition, descriptive observations were recorded. The only available standard for use in the field was the skin color scale of von Luschan. This was used and the skin color was given according to the numbers on the scale. As far as possible, the remaining descriptive characters were judged according to established classifications. Because of the necessarily greater subjective element involved in a personal estimate which is based on experience and training, the results from a tabulation of the descriptive characters should be allowed a wider margin of error than is necessary for the measurable characters. A more detailed description of the various characters may be found in Sullivan's Essentials of An-

thropometry[1] which was used as a guide and in his publications on Tonga,[2] Samoa,[3] and Marquesas.[4]

The following traits were observed:

Skin Color. Inner side of arm; cheek
Hair
  form
  texture
  color
  baldness
  beard—amount on upper cheek, on lower cheek, on chin, moustache
  body hair—amount on chest, on forearm, on leg
Eye
  color
  sclera
  fold
Nose
  bridge
  profile
  axis of nostrils
  septum, thickness, and exposure
Forehead slope
Glabella development
Lips, thickness
Prognathism, degree
Chin, prominence
Ear, presence of lobe, roll of helix, Darwin's point, crura
Teeth, eruption, loss of teeth, caries, incisor fold, position of upper incisors, cusps on lower second molars, bite, and pathologies.

Some of these characters present difficulties not only of observation but also of experience. In particular, the teeth are the most difficult of access, and consequently the records are not always complete for the observations on them.

POPULATION

Unlike the inhabitants of the Marquesas, the Society Islanders are not in any immediate danger of extinction. The earliest estimates of the population were probably inexact. Although these figures were only for Tahiti, nevertheless they give a generalized impression of the population trend. Cook in 1774 estimated the population of Tahiti to be 204,000. This figure was rapidly diminished through war and disease, as is shown by succeeding calculations. In 1797 the population was variously considered to be from 16,000 to 50,000. Gradually the number of inhabitants was reduced until about 1808 it became stabilized around 8,000. Roberts[5] gives the most recent official figures of 1924 as 9,072 for Tahiti and Moorea and 6,920 for the Leeward Islands which include Huahine, Raiatea, Borabora, Maupiti, and Tahaa, making a total of about 16,000. Stewart's Handbook[6] gives 16,500, and de Goes, quoted in the Handbook, estimates the population in 1922 to be about 20,000, some 3,000 of whom are Chinese.

Handy measured 202 individuals from all the islands of the group. Of these it was necessary to discard all those who confessed to admixture of non-Polynesian stocks, all inter-Polynesian crosses, and immature individuals. For comparability with the previous studies the lower age limit was set at 18 years. This left a series of 153, of whom 85 are males and 68 females. They are distributed in the following numbers, according to island of birth.

	Male	Female
Tahiti	18	20
Moorea	7	8
Huahine	7	9
Raiatea and Tahaa	9	10
Borabora	9	3
Maupiti	9	2
Mixed	26	16
Total	85	68

DISTRIBUTION

In Table I are listed the distribution of the various characters of the Society Islanders. In a later study a more detailed analysis of these distributions will be made, but for the present it is sufficient to call attention to some of the characteristics of the form of distribution among the Society Islanders. Without entering into involved statistics an inspection of Table I reveals that in many of the distributions departures from a normal curve are found. The significance of such deviations is evident in their effect on the calculated constants. From a study of those given here and in the previous papers of Sullivan, it is clear that at certain fairly definite points in the distributions minor modes tend to occur. The number of such modes varies from group to group but their occurrence is quite regular. As examples of that type of distribution which is frequent, we may turn to those for head length and minimum frontal diameter. In head length, the males show a sharp increase in frequency at 180 mm., again at 185 mm., with the major mode at 190 mm. For

[1] Sullivan, L. R., Essentials of anthropometry: Am. Mus. Nat. Hist., Anthropological Handbook, 1923.

[2] Sullivan, L. R., A contribution to Tongan somatology; based on field studies of E. W. Gifford and W. C. McKern: B. P. Bishop Mus., Mem. vol. 8, no. 4, 1922.

[3] Sullivan, L. R., A contribution to Samoan somatology; based on field studies of E. W. Gifford and W. C. McKern: B. P. Bishop Mus., Mem. vol. 8, no. 2, 1921.

[4] Sullivan, L. R., Marquesan somatology, with comparative notes on Samoa and Tonga; based on the field studies of E. S. Craighill Handy and Willowdean C. Handy: B. P. Bishop Mus., Mem. vol. 9, no. 2, 1923.

[5] Roberts, S. H., Population problems of the Pacific, London, 1927.

[6] Allen, Percy S., Stewart's handbook of the Pacific, Sydney, 1922.

the minimum frontal diameter the distribution is bi-modal, with one mode at 100 mm. and the other at 105 mm. Sullivan has called attention to the evidence of bi-modality in the Tongans for head length, face width, bigonial diameter, face height, and face index. Among the Marquesans also deviations from the normal distribution were pointed out for stature, span, minimum frontal diameter, nasal width, ear width, cephalic, nasal, and facial indices. The same recurrent departures from the normal distribution which were noted for the Tongans and Marquesans are common for the Society Islanders in both sexes. Such bi-modal and multi-modal curves together with skewness seem indicative of a heterogeneity in the population. The fact that similar distributions are characteristic not only of the Society Islanders but of the Marquesans and Tongans as well affords greater cogency to the hypothesis of the existence of several types in the Polynesian stock.

VARIABILITY

In Tables II-V are set forth the standard deviations and coefficients of variation for the Society Islanders, for two series of Hawaiians, for Samoans, Tongans, and Marquesans. In order to obtain a convenient measure of the average or general variability of each of these samples of the Polynesian people, the average standard deviation and coefficient of variation was calculated. By this crude estimate the relative tendencies to variability may be judged. If these average constants are arranged according to size, the males of Dunn's series[7] of Hawaiians have the largest average standard deviation, followed by the Marquesans. The Samoans and Society Islanders have the smallest. With the exception of the Hawaiians (Dunn) the differences do not appear to be great. The range is from 4.37 for the Samoans to 4.81 for the Marquesans (omitting Dunn's Hawaiians). For the females, Dunn's Hawaiians again have the largest average standard deviation. The next in magnitude are the Marquesan women. Samoan women have the lowest average.

In general the averages of the coefficients of variation bear out the variabilities indicated by the standard deviations. For the males, we find that again the Marquesans and Dunn's Hawaiians are the most variable and that the Samoans are the least. The order of the variabilities for the females series with the exception of the Hawaiians (Dunn) is the same as for standard deviation.

From a consideration then of both constants of variation it appears that the Marquesans, both male and female, are consistently among the most variable. Dunn's Hawaiians also show great variability which must to a certain extent be discounted because of the fewer constants represented in the average. The Samoan men and women have the lowest variability. The Society Islands men also have a low variability but the women are considerably more variable. It is the reverse with the Tongans; the men are more variable than the women.

DESCRIPTION OF THE SOCIETY ISLANDERS

Before proceeding to a comparison of the Society Islanders with other Polynesian groups, it would be profitable to give a short description of the physical type of the Society Islanders. In Tables VI and VII are listed the means of the anthropometric measurements, and in Table VIII the percentages for the descriptive characters. (See Pls. IV-VII.)

The impression of massiveness and size is borne out from an examination of the means of the Society Islanders. The stature of 171.35 cm. places them among the tallest people in the world. This tall stature is in general equivalent to the stature of the Nordic races of Europe, although selected groups of Englishmen, such as University students, show slightly superior statures. The head of the Society Islander is of medium length but of more than medium width, resulting in a cephalic index which is markedly brachycephalic. Both the face height and width are large, producing a face notable for its massiveness. The forehead, however, is narrow and gives to the architecture of the face a distinctive character which is often associated with the Polynesian. This narrow forehead in relation to a wide head and face is reflected in the low fronto-parietal and zygomatico-frontal indices. The nasal index is mesorrhine, but the actual dimensions are of considerable size although they do not equal the averages for the Samoans or Tongans. In body proportions and size the Society Islanders are relatively large. In general the women display the same development as the men.

Table VIII gives the percentages for the descriptive characters. Most of the Society Islanders have black hair. There are no blonds, although 13.41 per cent of the men and 15.15 per cent of the women have reddish brown hair. In form the

[7] Dunn, L. C., An anthropometrical study of Hawaiians of pure and mixed blood: Peabody Mus., Cambridge, Mass., Papers, vol. 11, no. 3, 1928.

hair is usually straight or low waved. The women show a slightly greater tendency toward curly and frizzly hair than the men. On the whole the hair texture is medium to fine with a greater percentage of fine hair among the women. With the exception of one individual all the members of the series have brown eyes. Dark brown is much more frequent than light brown. More than three-quarters of the group have some development of the epicanthic or Mongoloid fold, although for the most part the degree of development is slight or medium. The women have marked epicanthus to a greater extent than the men. The nose of the Society Islanders is usually straight in profile with a bridge of medium elevation, tending definitely toward a low elevation among women. Associated with this type of nose the axis of the nostril is found mainly transverse. A nasal septum which is wide and exposed further characterizes the average nose of the Society Islander. The brow of the Society Islander, although narrow, is moderately sloping and well developed in men in the region of glabella. There is practically no prognathism. The lips are moderately thick. The shovel-shaped incisor or keilodonty characteristic of Mongoloid and American Indian incisors is frequent among the Society Islanders.

INTER-ISLAND DIFFERENCES

Tables IX-XI give the means for the islands of the Society Group. Although the numbers are inadequate for a satisfactory analysis of inter-island differences, it is possible to see to what extent Handy's impressions are borne out. His feeling was that physical distinctions could be drawn between the *arii* (chiefs) and *manahune* (commoners) and the *titi* or *tapu* (lowest class). But the data do not lend themselves to such a social division. The following is a quotation from a personal communication from Handy:

> There seem to be differences in type between certain islands, notably Raiatea-Tahaa-Porapora [Borabora], Huahine, and Tahiti, and Maupiti also. But the situation is complicated by the fact that the racial differences should probably be sought not so much between different islands as between different localities on the same island; and, even more important, between different classes of the population in the same localities and throughout the islands.
>
> Then as to local differences. Historic relationships between certain localities suggest that these were dominated by groups of settlers that came at different times, who may or may not have differed racially. In Tahiti, for example, there are four main divisions of the island, sometimes spoken of as "clans." The name of one is said to have signified dark skin, which resulted, it is said, from the fact that the people wore only a loin cloth, never protecting themselves from the sun. Another "clan" is shown by traditional history to have come from Porapora and Raiatea, where there is a characteristic type that differs decidedly from the run of Tahitians.
>
> Again, in one district there are an inland plateau and a broad upper end of a large valley connecting with this plateau, which were inhabited by a tribal group whose members were inveterate enemies of the coastal people of the same district, to such an extent that the inland folk never came down to the sea, while those living by the sea never ventured on the plateau: a condition approximating, as you will see, the relationship between the Pueblo peoples in the Southwest and the Navajo when the former took to the mesa tops.

Handy observed a resemblance between the Huahineans and the Marquesans from Hivaoa. The interisland differences are not very great but there is a tendency for the Huahine averages to depart from the total means. In head width, face width, sitting height, and cephalic index, the deviations are in the direction of the Marquesans of Group I, which includes the island of Hivaoa, thus to some extent confirming Handy's impressions.

The Raiatea-Borabora group does not, however, show any marked departure from the total Society Group.

Stokes' group was collected mainly from the southern part of the island of Tahiti. This group is differentiated from Handy's Tahitian series by a much shorter and narrower head, narrower minimum frontal diameter, and narrower face width. (See Pls. IV-VII.)

COMPARATIVE NOTES ON THE SOCIETY ISLANDERS

MATERIAL AVAILABLE

In addition to that from the Society Islands, there now exists reliable information on the physical type of five other Polynesian island groups. Data on the Samoans, Tongans, and Marquesans were published by Sullivan. Of the two Hawaiian series one was measured by Sullivan and published by Wissler,[8] the other was analysed by Dunn from data obtained by Tozzer. Finally the Maori were measured by Buck.[9] The technique employed in the study of these groups is comparable as the anthropometric method used in each investigation is based on the International Agreement. The averages should, therefore, represent accurately the groups measured. Unfortunately the size of the series with the exception of Buck's Maoris and Dunn's and Sullivan's Hawaiians is rather small but for the purposes of my survey they appear to be adequate.

MEASUREMENTS

Stature

The Polynesian island groups show an amazing lack of mean variation in stature. Considering the geographical diversity between New Zealand and the Society Islands, the isolation of the various groups, it would not have been surprising to find considerable differences from island to island. But I find actually only a range of 3.5 cm., which is much less than is found, for example, in England or Scandinavia in the diverse social classes and districts. Is this homogeneity of stature among the Polynesians to be attributed to a widespread racial strain with a dominant tall stature, thus superficially covering a fundamental heterogeneity or to an unexpected unity which has differentiated but little during the course of many centuries?

Both the Society Islands men and women have a stature which is intermediate to the extremes represented by the relatively short Hawaiians and the correspondingly tall Tongans. The constants of variability show the Society Islanders as tending toward greater heterogeneity. However, this is only relative since the coefficients of variability among homogeneous groups such as those for the Egyptians surpasses the coefficient of 3.45 per cent, which we find for the Society Islanders. (See Table XII.)

Head Length

The means presented in Table XIII seem to fall into three groups. The Society Islanders and the Hawaiians are the shortest headed, and the Marquesans and the Maoris have the longest heads. Intermediate to these two subgroups stand the Samoans and Tongans. The Hawaiian males in Dunn's series have the very low mean of 182.42 cm. This discrepancy with the Hawaiians of Sullivan's series appears to be significant, but in part, at least, it may be the result of an addition of stevedores from Maui which was made to Dunn's series in 1920. From Dunn's data it appears that not only the stevedores but the islanders in general from Maui have shorter heads than the general average. This difference between the two Hawaiian series is not maintained for the women which bears out the assumption of a selective factor in Dunn's material.

The variability of the Society Islanders expressed by both the standard deviation and the coefficient of variability is of the same order as that of the Tongans, Marquesans, and Hawaiians. The Samoans are less variable than the Society Islanders. But Dunn's Hawaiians in both measures of variability greatly exceed the other Polynesians.

Head Width

The groups under discussion are arranged for head width in the reverse order from head length. The Society Islanders and Hawaiians stand at one end as the widest headed, with the Marquesans and Maori at the other as the narrowest. The Samoans and Tongans are identical in their average values and are again intermediate with the exception that the Marquesan women do not differ appreciably from the Tongans. As in head length, Dunn's series of Hawaiians are apparently anomalous for head width as well. They differ markedly from Sullivan's group. The presumptive explanation for head length may well apply here too.

With the possible exception of the Hawaiian series, the variability of the Society Islanders is slightly greater than the other Polynesian groups. Only with the Tongans does this difference approach significance. (See Table XIV.)

[8] Wissler, Clark, Observations on Hawaiian somatology: B. P. Bishop Mus., Mem., vol. 9, no. 4, 1927.

[9] Buck, P. H. (Te Rangi Hiroa), Maori somatology: Polynesian Soc., Jour., vol. 31, no. 121, pp. 37-44, no. 123, pp. 145-153, no. 124, pp. 159-170, 1922; vol. 32, no. 125, pp. 21-28, no. 128, pp. 189-199, 1923.

Minimum Frontal Diameter

The narrow brow, as a characteristic trait of the Polynesian, is borne out by the majority of the group means given in Table XV. The Society Islanders have the narrowest foreheads, with a mean of 102.93 mm. for the males and 101.43 mm. for the females. Both the Hawaiian men and women, however, have relatively wide foreheads. Yet the mean of 107.85 mm. for Hawaiian males is absolutely smaller than those of the Hawaiian crosses noted by Wissler.

The variation among the men of the Polynesian island groups is, with the exception of the Samoans, remarkably uniform. The Samoans, however, have a standard deviation about 1 mm. and a coefficient of variation about 1 per cent higher than the respective constants for the Society Islanders. There is much less uniformity among the women. The Society Islands female series is one of the less variable.

Face Width

The mean face width of the Society Islands men is 145.72 mm. Although this figure is on the upper limit of the variations of the means among the Polynesians, the significance of its deviation from the other groups, as measured by three times the probable error of the difference of the means, attains validity only in comparison with the Tongans and Marquesans. Dunn's Hawaiians also have much narrower faces, which is in harmony with their narrower heads. Aside from Dunn's Hawaiians these comparative groups show relatively small differences. Among the women, the Society Islanders have the widest faces but in the rest of the comparative groups there is great uniformity in the average values for face width. I have already noted that the females of Dunn's sample do not bear out the marked deviation from the Polynesian range which is typical for the men.

Both constants of variability indicate that the Society Islands men tend toward a lesser degree of variability, especially as compared with the Hawaiians. The women, on the other hand, are rather more intermediate in variability. (See Table XVI.)

Bigonial Diameter

In contrast to the minimum frontal diameter, the Society Islanders have relatively greater bigonial diameters. Again both Samoans and Tongans are uniform in the close resemblance of their means and in their significant deviation from the Society Islanders, Hawaiians, and Marquesans. These latter do not differ significantly from each other with the exception of the Society Islanders and Hawaiians. But arranged in the order of size, the means are 107.76 mm. for the Society Islanders, 109.5 mm. for the Marquesans, 111.18 mm. for the Hawaiians. The implication of this order from the point of view of interisland contact is still uncertain. The same relative positions are held by the women, although the differences are less marked.

The variability of the men and women in the Society Islands group exceeds those of the other series. The fluctuations from series to series are more marked for females. Here again the Samoan women show relatively and absolutely less variability than the males of the same group. (See Table XVII.)

Face Height

The Polynesians listed in Table XVIII fall into two groups. One is long faced and includes the Samoans and Tongans. The other, relatively but not absolutely short faced, consists of the Society Islanders, Hawaiians (both series), Marquesans, and Maoris. The difference between these two groups is statistically significant, but Sullivan points out that the personal equation involved in locating nasion may account for the anomalous position of the Samoans and Tongans who were measured by the same individuals. However, in the absence of a check sample, it is impossible to estimate the cogency of this assumption as opposed to the contrary hypothesis that the Samoans and Tongans are accurately represented by their means. There is some evidence in other traits that the uniform departure of the Samoans and Tongans from the other Polynesian groups is significant. The means for women exhibit a similar tendency toward a twofold division.

The Society Islands men have a standard deviation of 6.35 mm. and a coefficient of variation of 5.09 per cent. Both these constants place the series together with the Samoans among the least variable in the Table. The Society Islands women are relatively and absolutely more variable than the men.

Nose Height and Width

The nose is one of the most difficult of anthropometric characters to measure. The possibility of error enters not only in determining nasion but also in measuring the alae in a relaxed posi-

tion. Obviously, conclusions from apparently significant differences should not be drawn except from abundant evidence. However the nose height of the Samoans and Tongans is larger by 5.59 mm. and 3.29 mm. respectively than the means of the Society Islanders. This certainly is a large difference which appears to be significant beyond the personal error. In nose width, however, there is greater similarity between the comparative groups. The Maori, however, have a mean nasal width of 40.1 mm. contrasted with 43.40 for the Society Islanders. In connection with the narrower nose of the Maoris, Buck mentions that Maori mothers are accustomed to confine the nose with wooden pins in order to produce a narrow and high organ to fit their racial ideals of beauty.

The Society Islanders, male and female, show, compared to the comparative groups tabled, relatively low variabilities for nasal height. In nose width the Society Islands men are intermediate, where on the whole the differences are not great. But the women exhibit a slightly greater tendency toward variability, exceeding in both constants the other Polynesian women. (See Tables XIX and XX.)

Ear Height and Width

The ear height is remarkably uniform for the various groups listed in Table XXI. This is not so true for the women who show a tendency to differ from group to group. In ear width (Table XXII) the differences again are not very great. The males are uniform in the variability of ear height but show greater differences in ear width. The women tend toward relatively more variation with the exception of the Samoan women who are very homogeneous for both the height and width of the ear.

Cephalic Index

The range of the cephalic index among the Society Islands men is from 74 to 94. This is practically the same range as Dunn gives for the Hawaiians. From the distribution of head length and head width the grouping of the cephalic index revealed by Table XXIII is expected. The Society Islanders are the most brachycephalic of all the comparative groups. But together with the Hawaiians they form a unit contrasting with the mesocephalic Marquesans and Maoris. The Samoans and Tongans are very similar to each other and stand in an intermediate position. Among the women there is a tendency toward wider heads. For the women, as well as the men, the Hawaiians and Society Islanders join to form a unit more brachycephalic than the Samoans and Tongans. The Marquesan women, unlike the men, are slightly wider headed relatively than the Samoan-Tongan group.

The Society Islands men are the most variable for the cephalic index although in neither head length nor head breadth were they relatively variable. The Society Islands women likewise, with the exception of Dunn's sample of Hawaiians and the Tongans, are more variable than the other groups.

Fronto-Parietal Index

The very narrow forehead of the Society Islanders together with their great head width combine to characterize them as a group with a relatively low fronto-parietal index. The mean of the Society Islanders is significantly lower than any of the comparative groups. Apart from the slightly higher index of the Hawaiians, the means of the remaining Polynesian groups are very similar.

Both the men and women of the Society Islands are less variable than the other series given in Table XXIV. The differences, however, with the exception of the Marquesan series are not large.

Cephalo-Facial Index

The Society Islands men have a mean of 91.36 which is the lowest for any of our Polynesian groups. However, the difference from the Hawaiian mean is very small. The remaining series form a closely related group with means which show a tendency toward significantly higher indices. For the Maoris this becomes marked. Among the female series the division between the Society Islands-Hawaii and Samoa-Tonga-Marquesas-Maori is less pronounced.

The cephalo-facial is among the least variable of the indices. Among the series noted in Table XXV the Society Islands men are the least variable. This is not true, however, for the women who are relatively and absolutely more variable.

Zygomatico-Frontal Index

The narrow forehead of the Society Islanders serves to distinguish them for the zygomatico-frontal index. The mean for the males, 70.66, is the lowest average in Table XXVI. The Hawaiians, on the contrary, have relatively wider foreheads. In this index the Tongans are similar

to the Hawaiians. The Society Islands women also have the lowest index as contrasted with the Hawaiian women.

The variabilities of both sexes in the Society Islands group are relatively low.

Zygomatico-Gonial Index

There is considerable range in all the facial indices as well as in the zygomatico-gonial index. The variation of the means is from 71.7 to 77.06. The Society Islanders are intermediate in the range of Polynesian means for zygomatico-gonial index. On the other hand, that the Hawaiians possess a very massive face is corroborated by both the measurements and indices. The Samoans in this index show a tendency toward a relatively narrow lower jaw.

The Society Islands men as contrasted with their related Polynesian groups do not show a marked variability. The women on the other hand are by far the most variable group listed in Table XXVII.

Facial Index

The mean face index of 85.73 for Society Islands men places this group in the mesoprosope class. The Hawaiians (Wissler) and Maori are closely similar to the Society Islanders. But the Samoans and Tongans because of their extraordinarily long faces have indices which are significantly higher than is found for any of the other groups. Indeed, they are well within the leptoprosope division. The women fall into the same relative positions as the men.

The variability of neither the men nor women of the Society Islands shows any extreme. (See Table XXVIII.)

Nasal Index

All the Polynesian series in Table XXIX are mesorrhine. The Society Islanders together with both samples of Hawaiians and the Marquesans exhibit a tendency toward chamaerrhiny as opposed to the Samoans, Tongans, and Maoris who approach more nearly to leptorrhiny. With the Samoans and Tongans this can be accounted for by the great nasal height which they possess. The Maoris, however, have the narrowest noses of any of the comparative series.

Again the variabilities of the Society Islanders are intermediate in degree.

Ear Index

The short broad ear which characterizes the Polynesians in Table XXX approximates the Mongoloid type. The variations in the ear are very great so that the moderate degree of variation observed for Polynesian samples is not significant.

With the exception of the Marquesans the variabilities also are rather uniform.

RELATIONSHIP OF COMPARATIVE GROUPS

A convenient and concise method of evaluating roughly the degree of similarity or divergence of any particular group from the Society Islanders is presented in Tables XXXI and XXXII. The difference of the means of each group from those of the Society Islanders is obtained and the average differences for the measurements and indices are calculated. Although some of the significant relationships discussed in the preceding section are not apparent by this method, it does serve as a useful guide.

From a survey of Tables XXXI and XXXII it appears that Wissler's Hawaiians are most like the Society Islanders. Dunn's Hawaiians, however, show a slightly less mean difference for the indices, but this may be due to the fact that only three indices are represented in the average. The Marquesans stand next, followed by the Tongans and Samoans. The greatest divergence is found between the Society Islanders and Maoris. The atypical means of Dunn's series which have already been pointed out give a larger average difference for the measurements than that of any other group.

In general, the degrees of relationship established for males by this method holds good for the women as well. Both Hawaiian samples are closest to the Society Islands women. The Marquesan women are next in order of similarity. The Samoans and Tongans are the most diverse from the Society Islanders.

DESCRIPTIVE CHARACTERS

The question of a personal equation assumes a much more important aspect in dealing with descriptive traits than with measurements. Certain parallelisms between the Society Islanders and Marquesans, observed by Handy, and between the Samoans and Tongans, studied by Gifford and McKern, may well be the result of some personal bias in the judgment of the observers. A certain degree of uniformity, however, in recording these descriptive traits is vouched for by Sullivan, who had an opportunity to impress his standards on the field workers. At any rate, I have felt that it

would be wiser, in the absence of check samples by other investigators, to allow a wide margin of difference as a test of significance. (See Tables XXXIII and XXXIV.)

In hair form, the greatest percentage is found for straight and low waved. The exceptions are Dunn's Hawaiians and the Marquesans who possess an appreciable degree of the curly and frizzly varieties. The hair color is overwhelmingly black and dark brown. Handy observed a high per cent of reddish brown among the Society Islanders. There is great uniformity in eye color as well, the prevailing color being brown, dark more common than light brown. It is rather surprising to find among the Marquesan men, 7.2 per cent, and among women 9.5 per cent blue eyes. This may be the result of an undetected admixture of European blood which has proceeded steadily in Polynesia. The marked differences in facial and body hair development are clearly indicated by the percentages. The Society Islanders are much more glabrous than Tongans and Hawaiians. In this they resemble the Marquesans. Epicanthus is more frequent among the Society Islanders than in the Samoans, Tongans, or Hawaiians. The percentages of epicanthic fold for the Marquesans approach those of the Society Islanders. By a wide margin the Society Islanders have the greatest development of keilodonty found among the Polynesian groups.

SUMMARY

In this paper I have presented a brief study of the physical characters of the Society Islanders. A review of the available data on the Society Islanders leads me to consider them a heterogeneous group. Indeed, the distributions (Table I) of their anthropometric characters reveal a marked tendency towards bi-modal and multi-modal curves. Although the series is not large, the significance of these distributions is enhanced by the occurrence of similar distributions among other Polynesian groups. In fact, the recurrence of identical modes in the curves of the various island groups offers one method in the attempt to disentangle the diverse elements in the Polynesian race. Not only the analysis of these curves but geographical comparisons as well, indicate the existence of several types. Geographical segregation may be observed in head length, head width, and cephalic index. But the uniformity of means and of multi-modal curves found in other traits suggests that the heterogeneity characteristic of the Polynesians may be of old standing and already existing, to some extent, anterior to their invasion of Polynesia.

Compared with other Polynesian groups, the Society Islanders are markedly brachycephalic. They are divergent also in the narrowness of the minimum frontal diameter. In the fronto-parietal, cephalo-facial, zygomatico-frontal, zygomatico-gonial, and facial indices, the mean values of the Society Islanders are the lowest among the comparative groups of Polynesians.

Interisland differences appear to exist but the averages are based on such few numbers that no general conclusion can be drawn. The island of Huahine, however, shows the most marked deviation from the means of the total Society Islands group.

For both mensurable traits and descriptive characters, Wissler's Hawaiians, among the comparative groups of Polynesians, show the closest degree of similarity to the Society Islanders.

TABLE I. SERIATIONS

HEAD LENGTH			HEAD WIDTH			FACE HEIGHT			FACE BREADTH			MINIMUM FRONTAL DIAMETER			BIGONIAL DIAMETER		
mm.	Male	Female	mm.	Male	Female	mm.	Male	Female	mm.	Male	Female	mm.	Male	Female	mm.	Male	Female
160	....	1	145	....	1	104	....	1	125	....	1	89	1	....	88	....	1
161	....	....	146	1	5	105	....	....	126	....	....	90	....	....	89	....	....
162	....	1	147	3	3	106	....	....	127	....	....	91	....	....	90	....	3
163	....	....	148	....	3	107	....	1	128	....	....	92	1	....	91	....	2
164	....	....	149	....	2	108	....	3	129	....	....	93	....	1	92	1	....
165	....	....	150	1	6	109	....	2	130	....	2	94	3	....	93	1	2
166	....	1	151	....	2	110	....	3	131	2	1	95	2	5	94	1	3
167	....	1	152	....	5	111	2	4	132	....	1	96	2	1	95	1	3
168	....	....	153	3	7	112	1	....	133	....	4	97	3	5	96	1	2
169	....	....	154	....	1	113	2	4	134	....	3	98	....	3	97	....	1
170	....	3	155	9	8	114	3	8	135	....	7	99	2	2	98	....	....
171	....	1	156	6	4	115	1	4	136	....	6	100	18	22	99	1	3
172	2	1	157	3	3	116	1	6	137	1	6	101	1	3	100	5	4
173	....	1	158	9	2	117	....	5	138	1	....	102	7	4	101	2	2
174	1	1	159	1	2	118	5	1	139	2	2	103	6	3	102	3	5
175	1	8	160	9	5	119	2	1	140	7	7	104	2	....	103	5	4
176	1	3	161	7	4	120	5	4	141	2	7	105	16	3	104	4	4
177	....	4	162	9	3	121	6	2	142	8	3	106	3	4	105	6	3
178	1	5	163	9	1	122	4	3	143	8	4	107	5	5	106	2	3
179	....	1	164	3	....	123	1	2	144	3	2	108	3	1	107	8	7
180	9	11	165	3	....	124	3	2	145	9	8	109	....	....	108	1	3
181	1	3	166	4	....	125	5	1	146	4	1	110	5	3	109	4	5
182	1	6	167	3	....	126	9	2	147	10	....	111	....	1	110	7	1
183	2	2	168	1	....	127	6	1	148	4	2	112	1	1	111	10	....
184	3	3	169	....	....	128	2	2	149	3	....	113	2	....	112	3	1
185	9	3	170	....	....	129	3	4	150	7	1	114	1	....	113	4	3
186	2	1	171	....	....	130	7	....	151	3	....	115	1	....	114	2	....
187	4	....	172	....	....	131	5	....	152	3	....	.....	....	....	115	6	2
188	3	2	173	1	....	132	4	1	153	2	....	.....	....	....	116	2	1
189	5	....	.....	....	....	133	2	1	154	1	....	.....	....	....	117	3	....
190	12	3	.....	....	....	134	2	....	155	4	....	.....	..	....	118	....	....
191	1	2	.....	....	....	135	2	....	156	....	....	.....	....	....	119	....	....
192	4	....	.....	....	....	136	....	....	157	....	....	.....	....	....	120	1	....
193	9	....	.....	....	....	137	1	....	158	....	....	.....	....	....	121	1	....
194	1	....	.....	....	....	138	1	....	159	....	....	.....	....	....	.....	....	....
195	3	....	.....	....	....	.....	....	....	160	1	....	.....	....	....	.....	....	....
196	3	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....
197	1	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....
198	2	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....
199	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....
200	3	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....
201	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....
202	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....
.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....
203	1	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....
.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....
.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....
M	188.01±.48	178.85± 52	M	159.58±.36	154.13±.45	M	124.78±.46	118.47±.54	M	145.72± .38	138.94±.41	M	102.93± .37	101.43±.35	M	107.76± .45	102.60±.56
Sd.	6.54±.34	6.31±.36	Sd.	4.96±.26	5.46±.32	Sd.	6.35±.33	6.66±.39	Sd.	5.13± .27	4.96±.29	Sd.	4.99± .26	4.32±.25	Sd.	6.11± .32	6.83±.39
V	3.48±.18	3.53±.20	V	3.11±.16	3.54±.20	V	5.09±.26	5.62±.32	V	3.52± .18	3.57±.21	V	4.85± .25	4.26±.25	V	5.67± .29	6.66±.39

TABLE I. SERIATIONS (CONTINUED)

NOSE HEIGHT			NOSE BREADTH			EAR HEIGHT			EAR WIDTH			STATURE			SPAN		
mm.	Male	Female	mm.	Male	Female	mm.	Male	Female	mm.	Male	Female	cm.	Male	Female	cm.	Male	Female
45	....	3	32	....	1	50	....	1	25	....	2	150	....	1	151	....	1
46	1	....	33	....	....	51	....	....	26	1	....	151	....	....	152	....	....
47	1	3	34	....	....	52	....	1	27	1	1	152	....	1	153	....	1
48	3	6	35	....	4	53	....	....	28	1	3	153	....	3	154	....	1
49	4	3	36	....	5	54	....	....	29	2	6	154	....	1	155	....	....
50	3	7	37	1	6	55	1	2	30	5	11	155	....	4	156	....	3
51	10	8	38	2	10	56	1	2	31	10	12	156	....	4	157	....	5
52	5	11	39	4	5	57	1	2	32	18	9	157	1	2	158	....	....
53	8	8	40	2	10	58	2	7	33	13	11	158	....	8	159	....	3
54	10	3	41	14	2	59	....	5	34	12	6	159	2	5	160	....	1
55	8	6	42	13	9	60	1	3	35	10	2	160	....	4	161	....	4
56	7	3	43	12	7	61	7	2	36	5	2	161	2	3	162	....	5
57	11	3	44	8	5	62	2	7	37	6	1	162	1	3	163	....	4
58	3	1	45	7	2	63	10	2	38	1	1	163	1	9	164	....	4
59	5	....	46	6	....	64	8	8	39	....	1	164	3	4	165	2	5
60	4	....	47	7	1	65	9	5	.....	....	....	165	3	3	166	1	2
61	1	1	48	9	....	66	4	8	.....	....	....	166	7	2	167	....	2
62	1	1	49	....	....	67	6	5	.....	....	....	167	6	2	168	....	4
63	....	....	50	....	....	68	4	1	.....	....	....	168	3	2	169	1	4
64	....	....	51	....	1	69	9	2	.....	....	....	169	3	3	170	2	2
65	....	....	.....	....	....	70	6	3	.....	....	....	170	3	1	171	4	4
66	....	....	.....	....	....	71	7	....	.....	....	....	171	8	1	172	6	3
67	....	1	.....	....	....	72	1	1	.....	....	....	172	5	1	173	4	4
.....	....	....	.....	....	....	73	2	....	.....	....	....	173	6	....	174	2	....
.....	....	....	.....	....	....	74	....	1	.....	....	....	174	7	....	175	4	2
.....	....	....	.....	....	....	75	2	....	.....	....	....	175	....	1	176	3	....
.....	....	....	.....	....	....	76	2	....	.....	....	....	176	3	....	177	5	....
.....	....	....	.....	....	....	.....	....	....	.....	....	....	177	5	....	178	2	....
.....	....	....	.....	....	....	.....	....	....	.....	....	....	178	6	....	179	3	....
.....	....	....	.....	....	....	.....	....	....	.....	....	....	179	3	....	180	6	....
.....	....	....	.....	....	....	.....	....	....	.....	....	....	180	2	....	181	4	....
.....	....	....	.....	....	....	.....	....	....	.....	....	....	181	2	....	182	4	1
.....	....	....	.....	....	....	.....	....	....	.....	....	....	182	2	....	183	3	....
.....	....	....	.....	....	....	.....	....	....	.....	....	....	183	1	....	184	4	....
.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	185	2	....
.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	186	3	....
.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	187	2	....
.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	188	4	....
.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	189	3	....
.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	190	1	....
.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	191	1	....
.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	192	5	....
.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	193	2	....
.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	194	....	....
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.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....
M	54.21 ± .26	52.12 ± .32	M	43.40 ± .20	39.97 ± .27	M	66.09 ± .32	62.69 ± .38	M	32.96 ± .17	31.59 ± .21	M	171.35 ± .43	161.12 ± .43	M	180.10 ± .54	164.82 ± .52
Sd.	3.51 ± .18	3.87 ± .22	Sd.	2.77 ± .14	3.31 ± .19	Sd.	4.44 ± .23	4.70 ± .27	Sd.	2.33 ± .12	2.61 ± .15	Sd.	5.91 ± .31	5.21 ± .30	Sd.	7.36 ± .38	6.18 ± .36
V	6.47 ± .33	7.43 ± .43	V	6.37 ± .33	8.28 ± .48	V	6.72 ± .35	7.50 ± .43	V	7.07 ± .37	8.26 ± .48	V	3.45 ± .18	3.24 ± .19	V	4.09 ± .21	3.75 ± .22

TABLE I. SERIATIONS (CONTINUED)

SITTING HEIGHT			SHOULDER HEIGHT			TRUNK HEIGHT			ARM LENGTH			LEG LENGTH			CEPHALIC INDEX		
cm.	Male	Female	cm.	Male	Female	cm.	Male	Female	cm.	Male	Female	cm.	Male	Female		Male	Female
64	....	2	127	....	4	50	....	1	66	....	1	68	....	1	74	1	....
77	....	1	128	....	2	51	....	....	67	....	1	69	....	1	75	....	....
78	....	....	129	....	2	52	....	....	68	....	2	70	....	1	76	....	1
79	....	6	130	....	4	53	....	3	69	....	4	71	....	2	77	2	1
80	1	4	131	....	6	54	2	6	70	....	5	72	....	5	78	....	....
81	....	4	132	2	3	55	2	3	71	....	7	73	....	3	79	3	1
82	1	4	133	1	8	56	1	3	72	1	6	74	....	8	80	8	1
83	4	8	134	2	2	57	4	10	73	2	10	75	7	5	81	1	2
84	2	3	135	....	4	58	5	10	74	2	7	76	2	7	82	7	3
85	....	6	136	3	5	59	8	4	75	5	8	77	7	10	83	6	6
86	7	10	137	6	7	60	11	7	76	7	7	78	7	5	84	10	9
87	8	9	138	3	2	61	12	10	77	4	4	79	6	4	85	8	1
88	11	3	139	5	5	62	10	2	78	8	2	80	5	3	86	8	13
89	12	5	140	6	4	63	8	1	79	13	....	81	6	2	87	4	5
90	9	1	141	7	3	64	7	....	80	6	....	82	10	3	88	15	7
91	5	1	142	6	1	65	5	3	81	8	1	83	6	3	89	5	9
92	7	....	143	4	3	66	4	2	82	6	....	84	4	2	90	1	2
93	7	....	144	6	2	67	1	....	83	5	2	85	2	....	91	3	1
94	6	1	145	4	....	68	2	1	84	7	....	86	9	1	92	1	1
95	2	....	146	2	....	69	2	....	85	3	....	87	4	....	93	....	3
96	2	....	147	8	1	.....	....	....	86	2	....	88	4	....	94	2	1
97	1	....	148	1	....	.....	....	....	87	2	....	89	1	....	95	....	....
.....	....	....	149	3	....	.....	....	....	88	2	....	90	1	....	96	....	....
.....	....	....	150	4	....	.....	....	....	.....	....	....	91	2	....	97	....	1
.....	....	....	151	3	....	.....	....	....	.....	....	....	92	1	....	.....	....	....
.....	....	....	152	4	....	.....	....	....	.....	....	....	93	1	....	.....	....	....
.....	....	....	153	1	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....
.....	....	....	154	2	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....
.....	....	....	155	1	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....
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M	89.40±.25	83.88±.40	M	143.32 ± .41	135.22 ± .39	M	61.40 ± .24	58.55 ± .29	M	79.90 ± .27	73.36 ± .28	M	81.95 ± .33	76.58 ± .32	M	84.96 ± .28	86.21 ± .31
Sd.	3.43±.18	4.86±.28	Sd.	5.56 ± .29	4.80 ± .28	Sd.	3.24 ± .17	3.52 ± .21	Sd.	3.66 ± .19	3.34 ± .19	Sd.	4.48 ± .23	3.83 ± .22	Sd.	3.84 ± .20	3.82 ± .22
V	3.84±.20	5.79±.33	V	3.88 ± .20	3.55 ± .21	V	5.27 ± .27	6.01 ± .35	V	4.58 ± .24	4.55 ± .27	V	5.47 ± .28	5.00 ± .29	V	4.52 ± .23	4.43 ± .26

TABLE I. SERIATIONS (CONTINUED)

FACIAL INDEX			NASAL INDEX			FRONTO-PARIETAL INDEX			CEPHALO-FACIAL INDEX			ZYGOMATICO-FRONTAL INDEX			ZYGOMATICO-GONIAL INDEX		
	Male	Female		Male	Female		Male	Female		Male	Female		Male	Female		Male	Female
71	....	1	60	....	1	56	1	....	81	....	1	61	2	....	64	1	3
72	....	1	61	....	....	57	1	....	82	....	....	62	....	....	65	3	....
73	....	....	62	....	....	58	2	....	83	....	1	63	....	....	66	1	4
74	....	....	63	....	....	59	1	1	84	....	....	64	1	....	67	2	2
75	2	....	64	....	2	60	1	1	85	....	3	65	3	....	68	2	2
76	2	1	65	1	3	61	8	2	86	2	3	66	4	1	69	4	1
77	1	2	66	....	2	62	3	3	87	1	3	67	3	....	70	4	4
78	1	1	67	....	....	63	12	9	88	8	8	68	6	4	71	5	5
79	1	4	68	1	....	64	7	4	89	13	7	69	10	7	72	5	5
80	2	2	69	3	3	65	17	10	90	11	10	70	8	5	73	10	2
81	7	6	70	1	3	66	13	10	91	11	6	71	10	5	74	11	4
82	6	4	71	2	2	67	7	6	92	12	10	72	10	6	75	4	9
83	4	10	72	2	1	68	6	11	93	9	7	73	16	6	76	5	8
84	5	2	73	3	3	69	3	4	94	8	5	74	5	10	77	9	5
85	5	4	74	3	3	70	....	1	95	4	3	75	3	4	78	5	1
86	8	5	75	9	5	71	1	4	96	3	....	76	1	6	79	5	5
87	9	2	76	3	3	72	2	1	97	1	1	77	1	6	80	7	2
88	6	5	77	5	7	.....	....	....	98	1	....	78	2	4	81	1	3
89	11	7	78	4	6	.....	....	....	99	1	....	79	....	1	82	1	2
90	3	3	79	6	3	.....	....	....	.....	....	....	80	....	2	83	....	....
91	6	3	80	5	2	.....	....	....	.....	....	....	.....	....	....	84	....	....
92	1	2	81	4	6	.....	....	....	.....	....	....	.....	....	....	85	....	1
93	2	1	82	4	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....
94	2	1	83	5	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....
95	1	....	84	1	3	.....	....	....	.....	....	....	.....	....	....	.....	....	....
96	....	1	85	3	1	.....	....	....	.....	....	....	.....	....	....	.....	....	....
.....	....	....	86	2	3	.....	....	....	.....	....	....	.....	....	....	.....	....	....
.....	....	....	87	3	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....
.....	....	....	88	3	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....
.....	....	....	89	2	1	.....	....	....	.....	....	....	.....	....	....	.....	....	....
.....	....	....	90	2	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....
.....	....	....	91	3	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....
.....	....	....	92	1	2	.....	....	....	.....	....	....	.....	....	....	.....	....	....
.....	....	....	93	....	2	.....	....	....	.....	....	....	.....	....	....	.....	....	....
.....	....	....	94	2	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....
.....	....	....	95	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....
.....	....	....	96	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....
.....	....	....	97	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....
.....	....	....	98	1	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....
.....	....	....	99	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....
.....	....	....	100	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....
.....	....	....	101	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....
.....	....	....	102	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....
.....	....	....	103	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....
.....	....	....	104	1	1	.....	....	....	.....	....	....	.....	....	....	.....	....	....
.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....
.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....
M	85.73 ± .33	84.65 ± .41	M	80.32 ± .53	77.03 ± .65	M	64.56 ± .22	65.85 ± .23	M	91.36 ± .19	90.21 ± .25	M	70.66 ± .24	73.21 ± .27	M	74.01 ± .31	73.90 ± .39
Sd.	4.48 ± .23	5.00 ± .29	Sd.	7.22 ± .37	7.91 ± .46	Sd.	3.02 ± .16	2.78 ± .16	Sd.	2.65 ± .14	3.05 ± .18	Sd.	3.30 ± .17	3.32 ± .19	Sd.	4.19 ± .22	4.81 ± .28
V	5.23 ± .27	5.90 ± .34	V	8.99 ± .46	10.27 ± .59	V	4.68 ± .24	4.22 ± .25	V	2.90 ± .15	3.38 ± .20	V	4.67 ± .24	4.53 ± .26	V	5.66 ± .29	6.51 ± .38

TABLE I. SERIATIONS (CONTINUED)

EAR INDEX				RELATIVE SPAN				RELATIVE SITTING HEIGHT				RELATIVE SHOULDER HEIGHT				RELATIVE TRUNK LENGTH				RELATIVE ARM LENGTH			
Male			Female	Male			Female	Male			Female	Male			Female	Male			Female	Male			Female
38	....		1	98	....		3	50	1		....	50	1		1	50	1		....	50	....		1
41	1		1	50	....		1	48	....		....	82	6		1	31	....		....	42	....		....
50	1		1	99	2		3	50	1		....	50	7		5	50	1		....	50	....		....
42	....		....	50	....		4	49	1		1	83	19		14	32	....		....	43	....		3
50	2		....	100	....		7	50	4		2	50	13		9	50	....		3	50	1		4
43	....		....	50	2		6	50	3		3	84	12		16	33	3		....	44	2		6
50	1		1	101	2		4	50	8		6	50	17		11	50	3		3	50	7		9
44	....		3	50	2		4	51	6		4	85	3		3	34	3		2	45	6		12
50	1		....	102	1		3	50	4		7	50	5		4	50	10		7	50	8		4
45	4		....	50	5		4	52	12		6	86	1		1	35	8		5	46	11		7
50	....		1	103	6		2	50	9		3	50	....		....	50	9		5	50	9		6
46	....		1	50	1		2	53	15		13	87	....		2	36	8		4	47	10		5
50	3		2	104	6		4	50	9		8	50	....		1	50	15		13	50	5		3
47	4		5	50	8		5	54	5		4	.....	....		....	37	5		6	48	10		5
50	3		2	105	10		4	50	4		4	.....	....		....	50	9		6	50	3		1
48	6		1	50	7		....	55	2		2	.....	....		....	38	5		5	49	6		....
50	2		5	106	4		3	50	1		3	.....	....		....	50	....		1	50	3		....
49	5		2	50	8		1	.....	....		....	.....	....		....	39	4		1	50	1		....
50	6		1	107	3		2	.....	....		....	.....	....		....	50	....		....	50	1		1
50	8		9	50	2		1	.....	....		....	.....	....		....	40	....		2	.....	....		....
50	1		....	108	2		....	.....	....		....	.....	....		....	50	....		....	.....	....		....
51	5		2	50	6		1	.....	....		....	.....	....		....	41	....		2	.....	....		....
50	5		9	109	3		....	.....	....		....	.....	....		....	50	....		....	.....	....		....
52	3		1	50	2		....	.....	....		....	.....	....		....	42	....		....	.....	....		....
50	5		3	110	1		....	.....	....		....	.....	....		....	50	....		1	.....	....		....
53	7		1	50	....		....	.....	....		....	.....	....		....	.....	....		....	.....	....		....
50	1		3	111	1		....	.....	....		....	.....	....		....	.....	....		....	.....	....		....
54	2		2	.....	....		....	.....	....		....	.....	....		....	.....	....		....	.....	....		....
50	3		1	.....	....		....	.....	....		....	.....	....		....	.....	....		....	.....	....		....
55	2		1	.....	....		....	.....	....		....	.....	....		....	.....	....		....	.....	....		....
50	1		....	.....	....		....	.....	....		....	.....	....		....	.....	....		....	.....	....		....
56	....		....	.....	....		....	.....	....		....	.....	....		....	.....	....		....	.....	....		....
50	....		2	.....	....		....	.....	....		....	.....	....		....	.....	....		....	.....	....		....
57	1		1	.....	....		....	.....	....		....	.....	....		....	.....	....		....	.....	....		....
50	1		1	.....	....		....	.....	....		....	.....	....		....	.....	....		....	.....	....		....
58	....		1	.....	....		....	.....	....		....	.....	....		....	.....	....		....	.....	....		....
50	....		....	.....	....		....	.....	....		....	.....	....		....	.....	....		....	.....	....		....
59	....		....	.....	....		....	.....	....		....	.....	....		....	.....	....		....	.....	....		....
50	....		1	.....	....		....	.....	....		....	.....	....		....	.....	....		....	.....	....		....
60	1		1	.....	....		....	.....	....		....	.....	....		....	.....	....		....	.....	....		....
62	....		1	.....	....		....	.....	....		....	.....	....		....	.....	....		....	.....	....		....
68	....		1	.....	....		....	.....	....		....	.....	....		....	.....	....		....	.....	....		....
.....	....		....	.....	....		....	.....	....		....	.....	....		....	.....	....		....	.....	....		....
.....	....		....	.....	....		....	.....	....		....	.....	....		....	.....	....		....	.....	....		....
.....	....		....	.....	....		....	.....	....		....	.....	....		....	.....	....		....	.....	....		....
.....	....		....	.....	....		....	.....	....		....	.....	....		....	.....	....		....	.....	....		....
.....	....		....	.....	....		....	.....	....		....	.....	....		....	.....	....		....	.....	....		....
M	50.00 ± .26		50.58 ± .40	M	105.17 ± .18		102.23 ± .22	M	52.18 ± .12		52.46 ± .13	M	83.65 ± .07		83.94 ± .09	M	35.86 ± .12		36.33 ± .17	M	46.04 ± .12		45.50 ± .13
Sd.	3.56 ± .18		4.91 ± .28	Sd.	2.51 ± .13		2.61 ± .16	Sd.	1.58 ± .08		1.59 ± .09	Sd.	.98 ± .05		1.13 ± .07	Sd.	1.63 ± .08		1.99 ± .12	Sd.	1.57 ± .08		1.61 ± .09
V	7.12 ± .37		9.71 ± .56	V	2.39 ± .12		2.55 ± .15	V	3.03 ± .16		3.03 ± .18	V	1.17 ± .06		1.35 ± .08	V	4.55 ± .24		5.48 ± .32	V	3.41 ± .18		3.54 ± .21

TABLE I. SERIATIONS (CONTINUED)

RELATIVE LEG LENGTH			LEG-ARM INDEX		
Male		Female	Male		Female
50	1	3	85	1	....
45	2	2	50	....	1
50	4	4	86	....	....
46	5	3	50	....	1
50	8	9	87	....	....
47	16	13	50	....	....
50	9	3	88	....	1
48	12	6	50	1	....
50	4	7	89	....	1
49	6	4	50	1	....
50	8	6	90	....	....
50	3	3	50	1	2
50	4	2	91	2	1
51	1	1	50	2	3
50	1	....	92	1	5
52	....	....	50	1	2
50	1	....	93	2	2
.....	....	....	50	1	5
.....	....	....	94	4	1
.....	....	....	50	1	1
.....	....	....	95	4	5
.....	....	....	50	6	....
.....	....	....	96	2	8
.....	....	....	50	7	1
.....	....	....	97	....	2
.....	....	....	50	5	6
.....	....	....	98	....	....
.....	....	....	50	5	6
.....	....	....	99	4	....
.....	....	....	50	....	....
.....	....	....	100	10	2
.....	....	....	50	....	....
.....	....	....	101	4	....
.....	....	....	50	3	4
.....	....	....	102	....	....
.....	....	....	50	6	1
.....	....	....	103	....	3
.....	....	....	50	2	....
.....	....	....	104	2	1
.....	....	....	50	....	....
.....	....	....	105	1	....
.....	....	....	50	1	....
.....	....	....	106	....	....
.....	....	....	50	2	....
			107	....	....
			50	....	....
			108	....	....
			50	1	....
M	47.82 ± .12	47.62 ± .13	M	97.83 ± .33	95.59 ± .34
Sd.	1.58 ± .08	1.62 ± .09	Sd.	4.41 ± .23	4.06 ± .24
V	3.30 ± .17	3.36 ± .20	V	4.51 ± .24	4.25 ± .25

TABLE II. COMPARISON OF STANDARD DEVIATIONS

	Male					
	Society	Hawaii	Dunn's Hawaii	Samoa	Tonga	Marquesas
Stature	5.91	6.03	5.00	5.25	5.21	5.12
Head Length	6.54	6.78	8.90	5.69	6.89	7.00
Head Width	4.96	5.50	5.77	4.46	4.26	4.87
Minimum Frontal	4.99	4.97	.....	5.98	4.87	5.19
Face Width	5.13	6.10	8.25	5.23	5.94	4.88
Bigonial	6.11	5.88	.....	5.13	5.81	5.23
Face Height	6.35	6.69	7.22	6.56	6.81	7.30
Nose Height	3.51	3.87	4.12	3.64	3.91	3.97
Nose Width	2.77	3.02	2.80	2.59	3.02	2.70
Ear Height	4.44	4.54	.....	4.23	4.57	4.53
Ear Width	2.33	2.93	.....	2.76	2.62	3.05
Indices						
Cephalic	3.84	3.66	3.17	3.53	3.14	3.52
Fronto-Parietal	3.02	3.08	.....	3.30	3.51	3.75
Cephalo-Facial	2.65	3.07	.....	2.84	4.68	3.13
Zygomatico-Frontal	3.30	3.32	.....	3.55	4.23	4.37
Zygomatico-Gonial	4.19	3.75	.....	3.84	4.56	4.02
Facial	4.48	4.69	5.18	4.87	4.43	6.17
Nasal	7.22	7.24	7.73	5.86	7.58	7.75
Ear	3.56	3.97	.....	3.79	3.93	4.82
Average Sd.	4.49	4.69	5.81	4.37	4.74	4.81

TABLE III. COMPARISON OF STANDARD DEVIATIONS

	Female					
	Society	Hawaii	Dunn's Hawaii	Samoa	Tonga	Marquesas
Stature	5.21	4.72	4.68	4.92	5.83	5.11
Head Length	6.31	6.16	8.43	5.22	6.47	6.77
Head Width	5.46	4.85	5.88	3.87	5.06	3.98
Minimum Frontal	4.32	5.02	.....	3.96	4.65	7.10
Face Width	4.96	5.06	6.87	3.79	6.03	4.50
Bigonial	6.83	6.13	.....	3.93	4.80	5.67
Face Height	6.66	6.06	6.48	6.41	5.79	7.28
Nose Height	3.87	3.93	3.90	4.53	3.75	4.40
Nose Width	3.31	2.73	3.09	2.56	2.86	2.80
Ear Height	4.70	4.51	.....	3.33	3.97	5.99
Ear Width	2.61	2.80	.....	2.30	2.35	3.22
Indices						
Cephalic	3.82	3.63	3.92	2.98	4.09	3.66
Fronto-Parietal	2.78	3.21	.....	3.12	3.22	4.50
Cephalo-Facial	3.05	3.01	.....	2.63	3.23	3.08
Zygomatico-Frontal	3.32	3.07	.....	3.34	3.33	5.06
Zygomatico-Gonial	4.81	3.37	.....	3.50	3.57	3.32
Facial	5.00	5.08	3.93	5.03	4.32	5.69
Nasal	7.91	7.64	7.20	7.99	6.15	9.17
Ear	4.91	4.37	.....	4.53	3.93	4.83
Average Sd.	4.73	4.49	5.44	4.10	4.39	5.06

TABLE IV. COMPARISON OF COEFFICIENT OF VARIATION

	Male					
	Society	Hawaii	Dunn's Hawaii	Samoa	Tonga	Marquesas
Stature	3.45	3.6	2.92	3.05	3.01	3.00
Head Length	3.48	3.6	4.89	2.98	3.60	3.60
Head Width	3.11	3.4	3.80	2.88	2.75	3.20
Minimum Frontal	4.85	4.6	.....	5.78	4.64	5.00
Face Width	3.52	4.2	5.88	3.59	4.13	3.40
Bigonial	5.67	5.3	.....	4.90	5.54	4.80
Face Height	5.09	5.3	5.88	5.00	5.31	5.80
Nose Height	6.47	7.0	7.69	6.09	6.80	7.50
Nose Width	6.38	6.9	6.32	5.91	6.80	6.20
Ear Height	6.72	6.9	.....	6.39	6.92	6.80
Ear Width	7.07	8.6	.....	7.84	7.59	9.30
Indices						
Cephalic	4.52	4.4	3.80	4.34	3.87	4.40
Fronto-Parietal	4.68	4.5	.....	4.94	5.19	5.60
Cephalo-Facial	2.90	3.4	.....	3.01	5.04	3.30
Zygomatico-Frontal	4.67	4.4	.....	5.01	5.78	6.06
Zygomatico-Gonial	5.66	4.9	.....	5.42	6.22	5.20
Facial	5.23	5.4	5.91	5.42	4.96	7.10
Nasal	8.99	9.2	9.32	7.96	9.76	9.50
Ear	7.12	7.7	.....	7.11	7.50	9.90
Average C. V.	5.24	5.4	5.64	5.14	5.55	5.77

TABLE V. COMPARISON OF COEFFICIENTS OF VARIATION

	Female					
	Society	Hawaii	Dunn's Hawaii	Samoa	Tonga	Marquesas
Stature	3.24	3.0	2.88	3.05	3.58	3.20
Head Length	3.53	3.4	4.71	2.85	3.51	3.70
Head Width	3.54	3.2	3.91	2.61	3.37	2.70
Minimum Frontal	4.26	4.7	.....	3.90	4.51	7.00
Face Width	3.57	3.7	5.02	2.77	4.43	3.30
Bigonial	6.66	5.8	.....	3.96	4.83	5.50
Face Height	5.62	5.1	5.58	5.30	4.66	6.40
Nose Height	7.43	7.5	7.61	8.34	6.61	9.00
Nose Width	8.28	6.7	7.55	6.21	6.82	6.90
Ear Height	7.50	7.1	.....	5.44	6.15	9.60
Ear Width	8.26	8.4	.....	6.84	7.03	10.30
Indices						
Cephalic	4.43	4.3	4.66	3.68	5.01	4.50
Fronto-Parietal	4.22	4.6	.....	4.54	4.68	6.60
Cephalo-Facial	3.38	3.3	.....	2.84	3.54	3.40
Zygomatico-Frontal	4.53	4.0	.....	4.49	4.41	6.70
Zygomatico-Gonial	6.51	4.4	.....	4.83	4.92	4.40
Facial	5.90	5.9	4.62	5.60	4.75	6.70
Nasal	10.27	9.8	8.96	10.47	8.28	10.90
Ear	9.71	8.3	.....	8.25	7.58	9.70
Average C. V.	5.83	5.43	5.55	5.05	5.19	6.34

TABLE VI. SOCIETY ISLANDERS

Male	Mean	Sd.	C. V.
	mm.		
Head Length	188.01±.48	6.54±.34	3.48±.18
Head Width	159.58±.36	4.96±.26	3.11±.16
Minimum Frontal	102.93±.37	4.99±.26	4.85±.25
Face Width	145.72±.38	5.13±.27	3.52±.18
Bigonial	107.76±.45	6.11±.32	5.67±.29
Face Height	124.78±.46	6.35±.33	5.09±.26
Nose Height	54.21±.26	3.51±.18	6.47±.33
Nose Width	43.40±.20	2.77±.14	6.38±.33
Ear Height	66.09±.32	4.44±.23	6.72±.35
Ear Width	32.96±.17	2.33±.12	7.07±.37
	cm.		
Stature	171.35±.43	5.91±.31	3.45±.18
Span	180.10±.54	7.36±.38	4.09±.21
Sitting Height	89.40±.25	3.43±.18	3.84±.20
Shoulder Height	143.32±.41	5.56±.29	3.88±.20
Trunk Height	61.40±.24	3.24±.17	5.27±.27
Arm Length	72.90±.27	3.66±.19	4.58±.24
Leg Length	81.95±.33	4.48±.23	5.47±.28
Indices			
Cephalic	84.96±.28	3.84±.20	4.52±.23
Fronto-Parietal	64.56±.22	3.02±.16	4.68±.24
Cephalo-Facial	91.36±.19	2.65±.14	2.90±.15
Zygomatico-Frontal	70.66±.24	3.30±.17	4.67±.24
Zygomatico-Gonial	74.01±.31	4.19±.22	5.66±.29
Facial	85.73±.33	4.48±.23	5.23±.27
Nasal	80.32±.53	7.22±.37	8.99±.47
Ear	50.00±.26	3.56±.18	7.12±.37
Relative Span	105.17±.18	2.51±.13	2.39±.12
Relative Sitting Height	52.18±.12	1.58±.08	3.03±.16
Relative Shoulder Height	83.65±.07	.98±.05	1.17±.06
Relative Trunk Length	35.86±.12	1.63±.08	4.55±.24
Relative Arm Length	46.04+.12	1.57±.08	3.41±.18
Relative Leg Length	47.82±.12	1.58±.08	3.30±.17
Leg-Arm	97.83±.33	4.41±.23	4.51±.24

TABLE VII. SOCIETY ISLANDERS

Female	Mean	Sd.	C. V.
	mm.		
Head Length	178.85±.52	6.31±.36	3.53±.20
Head Width	154.13±.45	5.46±.32	3.54±.20
Minimum Frontal	101.43±.35	4.32±.25	4.26±.25
Face Width	138.94±.41	4.96±.29	3.57±.21
Bigonial	102.60±.56	6.83±.39	6.66±.39
Face Height	118.47±.54	6.66±.39	5.62±.33
Nose Height	52.12±.32	3.87±.22	7.43±.43
Nose Width	39.97±.27	3.31±.19	8.28±.48
Ear Height	62.69±.38	4.70±.27	7.50±.43
Ear Width	31.59±.21	2.61±.15	8.26±.48
	cm.		
Stature	161.12±.43	5.21±.30	3.24±.19
Span	164.82±.52	6.18±.37	3.75±.22
Sitting Height	83.88±.40	4.86±.28	5.79±.33
Shoulder Height	135.22±.39	4.80±.28	3.55±.21
Trunk Height	58.55±.29	3.52±.21	6.01±.35
Arm Length	73.36±.28	3.34±.19	4.55±.27
Leg Length	76.58±.32	3.83±.22	5.00±.29
Indices			
Cephalic	86.21±.31	3.82±.22	4.43±.26
Fronto-Parietal	65.85±.23	2.78±.16	4.22±.25
Cephalo-Facial	90.21±.25	3.05±.18	3.38±.20
Zygomatico-Frontal	73.21±.27	3.32±.19	4.53±.26
Zygomatico-Gonial	73.90±.39	4.81±.28	6.51±.38
Facial	84.65±.41	5.00±.29	5.90±.34
Nasal	77.03±.65	7.91±.46	10.27±.59
Ear	50.58±.40	4.91±.28	9.71±.56
Relative Span	102.23±.22	2.61±.16	2.55±.15
Relative Sitting Height	52.46±.13	1.59±.09	3.03±.18
Relative Shoulder Height	83.94±.09	1.13±.07	1.35±.08
Relative Trunk Length	36.33±.17	1.99±.12	5.48±.32
Relative Arm Length	45.50±.13	1.61±.09	3.54±.21
Relative Leg Length	47.62±.13	1.60±.09	3.36±.20
Leg-Arm	95.59±.34	4.06±.24	4.25±.25

TABLE VIII. QUALITATIVE CHARACTERS OF THE SOCIETY ISLANDERS

	MALE No.	MALE Per cent	FEMALE No.	FEMALE Per cent
Hair Form:				
Straight	38	44.70	30	44.12
Low waves	23	27.06	15	22.06
Deep waves	17	20.00	13	19.12
Curly	6	7.06	6	8.82
Frizzly	1	1.18	4	5.88
Woolly	0	.....	0	.....
Hair Color:				
Black	67	81.71	51	77.27
Dark brown	4	4.88	3	4.55
Reddish brown	11	13.41	10	15.15
Brown	....	.....	1	1.49
Light brown	....	.....	1	1.49
	82		66	
Gray	3	3.53	1	1.49
	85		67	
Hair Texture:				
Coarse	17	20.24	1	1.52
Medium	30	35.71	18	27.27
Fine	37	44.05	47	71.21

MALES

	Upper cheeks		Lower cheeks		Chin		Moustache	
Beard:								
None	48	60.76	47	59.49	7	8.86	3	4.17
Slight	20	25.32	16	20.25	42	53.16	45	62.50
Medium	11	13.92	16	20.25	30	37.97	22	30.55
Marked	....	.....					2	2.78

	Chest		Forearm		Leg	
Body Hair:						
None	47	64.38	28	36.84	17	22.67
Slight	16	21.92	32	42.10	37	49.33
Medium	10	13.70	15	19.74	21	28.00
Marked	....	.....	1	1.32		

	MALE		FEMALE	
Eye Color:				
Black	....	.....	....	.....
Dark brown	70	83.33	57	83.82
Light brown	13	15.48	11	16.18
Mixed	1	1.19		
Blue	....	.....		

	MALE		FEMALE	
Sclera:				
Clear	14	16.87	23	33.82
Unclear	69	83.13	45	66.18
Eye Fold:				
Absent	15	17.86	6	8.95
Trace	38	45.24	24	35.82
Medium	25	29.76	23	34.33
Marked	6	7.14	14	20.90
Nasal Bridge:				
Low	16	19.51	31	50.00
Medium	62	75.61	31	50.00
High	4	4.88		
Axis of Nostrils:				
Antero-posterior	....	.....	....	.....
Oblique	19	22.35	12	17.65
Transverse	66	77.65	56	82.35
Septum:				
Wide	53	68.83	44	68.75
Medium	19	24.68	15	23.44
Narrow	5	6.49	5	7.81
Exposed	45	54.22	37	55.22
Level	19	22.89	18	26.87
Hidden	19	22.89	12	17.91
Forehead:				
Vertical	11	13.42	13	20.00
Moderate	56	68.29	49	75.38
Low	15	18.29	3	4.62
Glabella:				
Smooth	4	4.88	30	45.45
Medium	32	39.02	34	51.52
Prominent	46	56.10	2	3.03
Lips:				
Thin	1	1.19	....	.....
Medium	74	88.10	63	92.65
Thick	9	10.71	5	7.35

	MALE		FEMALE	
Prognathism:				
None	82	98.80	67	98.53
Medium	1	1.20	1	1.47
Marked	....	.....	....	.....
Chin:				
Prominent	18	22.22	7	10.45
Medium	61	75.31	60	89.55
Receding	2	2.47	....	.....
Teeth:				
Incisor Fold				
Laterals				
Absent	10	16.39	4	11.76
Slight	21	34.43	14	41.18
Marked	30	49.18	16	47.06
Mesials				
Absent	9	14.52	4	11.11
Slight	20	32.26	10	27.78
Marked	33	53.23	22	61.11
Position of upper mesial incisors				
^	11	21.57	4	11.76
—	28	54.90	17	50.00
V	12	23.53	13	38.24
Upper incisors				
Vertical	44	83.02	32	91.43
Projecting slightly	7	13.21	3	8.57
Projecting markedly	2	3.77	....	.....
Number of cusps on lower second molars				
Right				
4	17	41.46	8	36.36
5	24	58.54	14	63.64
Left				
4	20	46.51	8	34.78
5	23	53.49	15	65.22
Bite:				
Under	2	3.28	....	.....
Edge to edge	20	32.79	10	27.03
Slight overbite	21	34.43	19	51.35
Marked overbite	18	29.51	8	21.62

TABLE IX. INTERISLAND DIFFERENCES

MALE

	Total Society	Tahiti	Moorea	Raiatea	Borabora	Huahine	Maupiti	Tahiti (Stokes)
Number	85	18	7	9	9	7	9	12
Stature	171.35	170.9	168.0	173.66	172.2	169.3	171.0	170.17
Head Length	188.01	185.33	188.11	187.33	189.56	189.0	188.88	181.58
Head Width	159.58	161.28	160.11	157.22	159.22	156.57	160.56	156.58
Minimum Frontal	102.93	102.67	104.57	102.0	103.2	102.4	100.56	98.6
Face Width	145.72	145.71	145.57	144.0	146.0	142.7	148.78	141.58
Bigonial	107.76	104.78	109.30	107.10	108.56	104.28	108.1	107.58
Face Height	124.78	124.83	123.11	123.10	126.91	124.29	120.78	122.33
Nose Height	54.21	53.77	55.11	51.56	54.0	53.86	53.89	54.17
Nose Width	43.40	43.45	42.0	43.33	44.78	44.0	43.67	42.50
Ear Height	66.09	63.33	67.70	66.56	69.13	65.4	66.22	65.42
Ear Width	32.96	33.00	34.30	33.67	33.44	31.30	33.11	36.25
Indices								
Cephalic	84.96	87.12	85.15	84.00	84.14	82.9	85.12	86.25
Fronto-Parietal	64.56	63.70	65.34	64.95	64.86	65.44	62.65	63.09
Cephalo-Facial	91.36	90.02	90.93	91.65	91.72	91.17	92.69	90.50
Zygomatico-Frontal	70.66	70.82	71.86	70.81	70.73	71.78	67.63	69.86
Zygomatico-Gonial	74.01	72.28	75.03	74.38	74.41	73.12	72.70	76.00
Facial	85.73	86.16	84.56	85.48	86.91	87.05	81.27	86.87
Nasal	80.32	81.07	76.30	84.27	83.14	81.88	81.47	79.07
Ear	50.00	52.23	50.68	50.66	48.33	47.90	49.98	55.50
Shoulder Height	143.32	143.44	140.14	145.33	140.22	141.43	142.78	.....
Sitting Height	89.40	88.00	88.43	90.00	91.44	87.57	89.78	.....
Span	180.10	177.89	176.29	180.56	182.44	179.14	179.00	.....
Indices								
Relative Shoulder	83.65	83.91	83.42	83.67	83.44	83.56	83.47	.....
Relative Arm Length	46.04	45.99	47.23	45.77	46.00	45.82	47.44	.....
Relative Leg Length	47.82	48.50	47.35	48.16	46.89	48.28	49.67	.....
Relative Sitting Height	52.18	51.50	52.65	51.84	53.11	51.72	52.55	.....
Relative Span	105.17	104.07	104.95	104.01	105.91	105.81	105.55	.....
Relative Trunk	35.86	35.41	36.07	35.51	36.66	35.28	36.02	.....
Leg-Arm	97.83	94.94	99.77	95.10	98.35	98.01	101.12	.....

TABLE X. INTERISLAND DIFFERENCES

MALE

	Tahiti	Raiatea-Borabora	Huahine	Maupiti
	18	18	7	9
Stature	170.90	172.93	169.30	171.00
Head Length	185.33	188.44	189.00	188.88
Head Width	161.28	158.22	156.57	160.56
Minimum Frontal	102.67	102.60	102.40	100.56
Face Width	145.71	145.00	142.70	148.78
Bigonial	104.78	107.83	104.28	108.10
Face Height	124.83	125.00	124.29	120.78
Nose Height	53.77	52.78	53.86	53.89
Nose Width	43.45	44.05	44.00	43.67
Ear Height	63.33	67.84	65.40	66.22
Ear Width	33.00	33.56	31.30	33.11
Indices				
Cephalic	87.12	84.07	82.90	85.12
Fronto-Parietal	63.70	64.90	65.44	62.65
Cephalo-Facial	90.02	91.68	91.17	92.69
Zygomatico-Frontal	70.82	70.77	71.78	67.63
Zygomatico-Gonial	72.28	74.40	73.12	72.70
Facial	86.16	86.20	87.05	81.27
Nasal	81.07	83.70	81.88	81.47
Ear	52.23	49.50	47.90	49.98

TABLE XI. INTERISLAND DIFFERENCES

	Female					
	Total Society	Tahiti	Moorea	Raiatea	Huahine	Tahiti (Stokes)
Number	68	20	8	10	9	6
Stature	161.12	161.0	157.38	162.2	161.56	162.8
Head Length	178.85	178.30	178.88	177.6	179.22	179.17
Head Width	154.13	155.65	156.00	151.6	151.0	153.33
Minimum Frontal	101.43	101.95	104.00	99.3	101.78	104.33
Face Width	138.94	140.20	137.5	137.1	138.0	138.5
Bigonial	102.60	102.20	101.25	100.9	103.56	102.83
Face Height	118.47	119.0	119.5	114.2	117.22	121.33
Nose Height	52.12	52.95	54.5	49.5	51.89	52.17
Nose Width	39.97	40.45	41.0	40.5	39.1	38.67
Ear Height	62.69	61.25	64.0	63.5	62.56	63.0
Ear Width	31.59	31.20	33.25	32.4	31.33	33.0
Indices						
Cephalic	86.21	87.37	87.26	85.46	84.29	85.62
Fronto-Parietal	65.85	65.54	66.68	65.55	67.41	68.04
Cephalo-Facial	90.21	90.11	88.14	90.46	91.39	90.31
Zygomatico-Frontal	73.21	72.78	75.74	72.47	73.78	75.37
Zygomatico-Gonial	73.90	72.97	73.68	73.65	75.07	74.23
Facial	84.65	84.97	86.95	83.27	85.03	87.73
Nasal	77.03	76.73	75.12	81.95	75.64	74.18
Ear	50.58	51.15	51.97	51.22	50.21	52.47
Shoulder Height	135.22	134.90	131.75	135.60	136.44	.....
Sitting Height	83.88	84.30	81.00	85.30	83.00	.....
Span	164.82	164.77	161.25	164.10	165.00	.....
Indices						
Relative Shoulder	83.94	83.78	83.72	83.60	84.45	.....
Relative Arm Length	45.50	45.51	45.69	45.05	46.06	.....
Relative Leg Length	47.62	47.70	48.52	47.38	47.01	.....
Relative Sitting Height	52.46	52.35	51.48	52.62	52.99	.....
Relative Span	102.23	101.48	102.49	101.18	102.12	.....
Relative Trunk	36.33	36.14	35.21	36.22	37.08	.....
Leg-Arm	95.59	95.45	94.30	95.13	96.85	.....

TABLE XII. STATURE

	Male			Female		
	Mean	Sd.	C. V.	Mean	Sd.	C. V.
Society	171.35±.43	5.91±.31	3.45±.18	161.12± .43	5.21±.30	3.24±.19
Hawaii	169.51±.42	6.03	3.60	159.05± .36	4.72	3.00
Hawaii (Dunn)	171.31±.40	5.00±.29	2.92±.17	162.59± .54	4.68±.38	2.88±.23
Samoa	171.70±.63	5.25	3.05	161.20±1.02	4.92	3.05
Tonga	173.00±.54	5.21	3.01	162.50± .62	5.83	3.58
Marquesas	170.30±.58	5.12	3.00	160.70± .60	5.11	3.20
Maori	170.60					

TABLE XIII. HEAD LENGTH

	Male			Female		
	Mean	Sd.	C. V.	Mean	Sd.	C. V.
Society	188.01±.48	6.54±.34	3.48±.18	178.85± .52	6.31±.36	3.53±.20
Hawaii	187.85±.42	6.78	3.60	180.21± .46	6.16	3.40
Hawaii (Dunn)	182.42±.70	8.90±.49	4.89±.27	178.79± .97	8.43±.69	4.71±.39
Samoa	190.60±.69	5.69	2.98	183.00±1.08	5.22	2.85
Tonga	191.00±.63	6.89	3.60	184.10± .65	6.47	3.51
Marquesas	193.20±.76	7.00	3.60	183.20± .79	6.77	3.70
Maori	196.50					

TABLE XIV. HEAD WIDTH

	Male			Female		
	Mean	Sd.	C. V.	Mean	Sd.	C. V.
Society	159.58±.36	4.96±.26	3.11±.16	154.13±.45	5.46±.32	3.54±.20
Hawaii	157.67±.38	5.50	3.40	152.50±.37	4.85	3.20
Hawaii (Dunn)	152.03±.45	5.77±.32	3.80±.21	150.26±.68	5.88±.48	3.91±.32
Samoa	154.80±.54	4.46	2.88	148.10±.80	3.87	2.61
Tonga	154.80±.39	4.26	2.75	150.00±.51	5.06	3.37
Marquesas	153.20±.53	4.87	3.20	150.10±.46	3.98	2.70
Maori	152.80					

TABLE XV. MINIMUM FRONTAL DIAMETER

	Male			Female		
	Mean	Sd.	C. V.	Mean	Sd.	C. V.
Society	102.93±.37	4.99±.26	4.85±.25	101.43±.35	4.32±.25	4.26±.25
Hawaii	107.85±.35	4.97	4.60	106.06±.38	5.02	4.70
Samoa	103.40±.72	5.98	5.78	101.50±.82	3.96	3.90
Tonga	104.80±.45	4.87	4.64	103.00±.47	4.65	4.51
Marquesas	103.20±.57	5.19	5.00	102.10±.82	7.10	7.00

TABLE XVI. FACE WIDTH

	Male			Female		
	Mean	Sd.	C. V.	Mean	Sd.	C. V.
Society	145.72±.38	5.13±.27	3.52±.18	138.94±.41	4.96±.29	3.57±.21
Hawaii	144.50±.42	6.10	4.20	136.98±.38	5.06	3.70
Hawaii (Dunn)	140.19±.65	8.25±.46	5.88±.39	136.71±.79	6.87±.56	5.02±.41
Samoa	145.90±.63	5.23	3.59	136.50±.79	3.79	2.77
Tonga	143.50±.55	5.94	4.13	136.10±.61	6.03	4.43
Marquesas	143.20±.53	4.88	3.40	135.50±.52	4.50	3.30
Maori	145.70					

TABLE XVII. BIGONIAL DIAMETER

	Male			Female		
	Mean	Sd.	C. V.	Mean	Sd.	C. V.
Society	107.76±.45	6.11±.32	5.67±.29	102.60±.56	6.83±.39	6.66±.39
Hawaii	111.18±.41	5.88	5.30	104.85±.46	6.13	5.80
Samoa	104.60±.62	5.13	4.90	99.00±.82	3.93	3.96
Tonga	104.80±.54	5.81	5.54	99.20±.49	4.80	4.83
Marquesas	109.50±.59	5.23	4.80	103.00±.68	5.67	5.50

TABLE XVIII. FACE HEIGHT

	Male			Female		
	Mean	Sd.	C. V.	Mean	Sd.	C. V.
Society	124.78±.46	6.35±.33	5.09±.26	118.47± .54	6.66±.39	5.62±.33
Hawaii	125.43±.47	6.69	5.30	118.05± .46	6.06	5.10
Hawaii (Dunn)	122.72±.57	7.22±.40	5.88±.39	116.21± .75	6.48±.53	5.58±.46
Samoa	131.10±.79	6.56	5.00	121.10±1.33	6.41	5.30
Tonga	128.20±.63	6.81	5.31	124.10± .58	5.79	4.66
Marquesas	124.10±.80	7.30	5.80	114.50± .85	7.28	6.40
Maori	124.00					

TABLE XIX. NOSE HEIGHT

	Male			Female		
	Mean	Sd.	C. V.	Mean	Sd.	C. V.
Society	54.21 ± .26	3.51 ± .18	6.47 ± .33	52.12 ± .32	3.87 ± .22	7.43 ± .43
Hawaii	55.60 ± .27	3.87	7.00	52.08 ± .30	3.93	7.50
Hawaii (Dunn)	53.59 ± .32	4.12 ± .23	7.69 ± .43	51.23 ± .45	3.90 ± .32	7.61 ± .62
Samoa	59.80 ± .43	3.64	6.09	54.30 ± .94	4.53	8.34
Tonga	57.50 ± .36	3.91	6.80	56.70 ± .38	3.75	6.61
Marquesas	53.10 ± .43	3.97	7.50	48.60 ± .51	4.40	9.00
Maori	52.80					

TABLE XX. NOSE WIDTH

	Male			Female		
	Mean	Sd.	C. V.	Mean	Sd.	C. V.
Society	43.40 ± .20	2.77 ± .14	6.38 ± .33	39.97 ± .27	3.31 ± .19	8.28 ± .48
Hawaii	43.53 ± .21	3.02	6.90	40.42 ± .21	2.73	6.70
Hawaii (Dunn)	44.22 ± .22	2.80 ± .15	6.32 ± .35	40.94 ± .36	3.09 ± .25	7.55 ± .62
Samoa	43.80 ± .31	2.59	5.91	41.20 ± .90	2.56	6.21
Tonga	44.40 ± .27	3.02	6.80	41.90 ± .29	2.86	6.82
Marquesas	43.20 ± .30	2.70	6.20	40.40 ± .33	2.80	6.90
Maori	40.10					

TABLE XXI. EAR HEIGHT

	Male			Female		
	Mean	Sd.	C. V.	Mean	Sd.	C. V.
Society	66.09 ± .32	4.44 ± .23	6.72 ± .35	62.69 ± .38	4.70 ± .27	7.50 ± .43
Hawaii	66.08 ± .32	4.54	6.90	63.67 ± .34	4.51	7.10
Samoa	66.10 ± .50	4.23	6.39	61.20 ± .69	3.33	5.44
Tonga	66.00 ± .42	4.57	6.92	64.50 ± .40	3.97	6.15
Marquesas	67.10 ± .49	4.53	6.80	62.70 ± .70	5.99	9.60

TABLE XXII. EAR WIDTH

	Male			Female		
	Mean	Sd.	C. V.	Mean	Sd.	C. V.
Society	32.96 ± .17	2.33 ± .12	7.07 ± .37	31.59 ± .21	2.61 ± .15	8.26 ± .48
Hawaii	34.13 ± .20	2.93	8.60	33.30 ± .21	2.80	8.40
Samoa	35.20 ± .33	2.76	7.84	33.60 ± .48	2.30	6.84
Tonga	34.50 ± .24	2.62	7.59	33.40 ± .23	2.35	7.03
Marquesas	32.70 ± .33	3.05	9.30	31.20 ± .37	3.22	10.30

TABLE XXIII. CEPHALIC INDEX

	Male			Female		
	Mean	Sd.	C. V.	Mean	Sd.	C. V.
Society	84.96 ± .28	3.84 ± .20	4.52 ± .23	86.21 ± .31	3.82 ± .22	4.43 ± .26
Hawaii	84.01 ± .26	3.66	4.40	84.69 ± .27	3.63	4.30
Hawaii (Dunn)	83.44 ± .25	3.17 ± .17	3.80 ± .20	84.16 ± .45	3.92 ± .32	4.66 ± .43
Samoa	81.30 ± .42	3.53	4.34	80.80 ± .62	2.98	3.68
Tonga	81.10 ± .29	3.14	3.87	81.60 ± .41	4.09	5.01
Marquesas	79.40 ± .38	3.52	4.40	82.00 ± .42	3.66	4.50
Maori	77.70					

TABLE XXIV. FRONTO-PARIETAL INDEX

	Male			Female		
	Mean	Sd.	C. V.	Mean	Sd.	C. V.
Society	64.56 ± .22	3.02 ± .16	4.68 ± .24	65.85 ± .23	2.78 ± .16	4.22 ± .25
Hawaii	68.44 ± .21	3.08	4.50	69.59 ± .24	3.21	4.60
Samoa	66.80 ± .40	3.30	4.94	68.80 ± .65	3.12	4.54
Tonga	67.60 ± .32	3.51	5.19	68.70 ± .32	3.22	4.68
Marquesas	67.40 ± .41	3.75	5.60	68.00 ± .52	4.50	6.60

TABLE XXV. CEPHALO-FACIAL INDEX

	Male			Female		
	Mean	Sd.	C. V.	Mean	Sd.	C. V.
Society	91.36 ± .19	2.65 ± .14	2.90 ± .15	90.21 ± .25	3.05 ± .18	3.38 ± .20
Hawaii	91.68 ± .21	3.07	3.40	89.89 ± .23	3.01	3.30
Samoa	94.20 ± .34	2.84	3.01	92.40 ± .54	2.63	2.84
Tonga	92.80 ± .43	4.68	5.04	91.20 ± .32	3.23	3.54
Marquesas	93.50 ± .34	3.13	3.30	90.30 ± .36	3.08	3.40
Maori	95.30					

TABLE XXVI. ZYGOMATICO-FRONTAL INDEX

	Male			Female		
	Mean	Sd.	C. V.	Mean	Sd.	C. V.
Society	70.66 ± .24	3.30 ± .17	4.67 ± .24	73.21 ± .27	3.32 ± .19	4.53 ± .26
Hawaii	74.73 ± .23	3.32	4.40	77.45 ± .23	3.07	4.00
Samoa	70.90 ± .43	3.55	5.01	74.50 ± .69	3.34	4.49
Tonga	73.10 ± .39	4.23	5.78	75.40 ± .33	3.33	4.41
Marquesas	72.00 ± .48	4.37	6.06	75.20 ± .59	5.06	6.70

TABLE XXVII. ZYGOMATICO-GONIAL INDEX

	Male			Female		
	Mean	Sd.	C. V.	Mean	Sd.	C. V.
Society	74.01 ± .31	4.19 ± .22	5.66 ± .29	73.90 ± .39	4.81 ± .28	6.51 ± .38
Hawaii	77.06 ± .26	3.75	4.90	76.48 ± .25	3.37	4.40
Samoa	71.70 ± .46	3.84	5.42	72.50 ± .73	3.50	4.83
Tonga	73.20 ± .42	4.56	6.22	72.50 ± .36	3.57	4.92
Marquesas	76.80 ± .44	4.02	5.20	75.90 ± .40	3.32	4.40

TABLE XXVIII. FACIAL INDEX

	Male			Female		
	Mean	Sd.	C. V.	Mean	Sd.	C. V.
Society	85.73 ± .33	4.48 ± .23	5.23 ± .27	84.65 ± .41	5.00 ± .29	5.90 ± .34
Hawaii	86.74 ± .35	4.69	5.40	86.17 ± .39	5.08	5.90
Hawaii (Dunn)	87.67 ± .41	5.18 ± .29	5.91 ± .33	85.07 ± .45	3.93 ± .32	4.62 ± .38
Samoa	89.90 ± .59	4.87	5.42	89.80±1.05	5.03	5.60
Tonga	89.20 ± .41	4.43	4.96	90.80 ± .43	4.32	4.75
Marquesas	87.00 ± .70	6.17	7.10	84.70 ± .67	5.69	6.70
Maori	85.10					

TABLE XXIX. NASAL INDEX

	Male			Female		
	Mean	Sd.	C. V.	Mean	Sd.	C. V.
Society	80.32 ± .53	7.22 ± .37	8.99 ± .47	77.03± .65	7.91 ± .46	10.27±.59
Hawaii	78.41 ± .55	7.24	9.20	78.13± .58	7.64	9.80
Hawaii (Dunn)	82.94 ± .61	7.73 ± .43	9.32 ± .52	80.38± .83	7.20 ± .58	8.96±.74
Samoa	73.60 ± .70	5.86	7.96	76.30±1.66	7.99	10.47
Tonga	77.60 ± .70	7.58	9.76	74.20± .62	6.15	8.28
Marquesas	81.90 ± .85	7.75	9.50	83.60±1.07	9.17	10.90
Maori	75.90					

TABLE XXX. EAR INDEX

	Male			Female		
	Mean	Sd.	C. V.	Mean	Sd.	C. V.
Society	50.00 ± .26	3.56 ± .18	7.12 ± .37	50.58 ± .40	4.91 ± .28	9.71 ± .56
Hawaii	51.74 ± .28	3.97	7.70	52.42 ± .33	4.37	8.30
Samoa	53.30 ± .46	3.79	7.11	54.90 ± .94	4.53	8.25
Tonga	52.40 ± .36	3.93	7.50	51.80 ± .39	3.93	7.58
Marquesas	48.90 ± .52	4.82	9.90	49.60 ± .56	4.83	9.70

TABLE XXXI. DIFFERENCES FROM THE SOCIETY ISLANDS MEANS

	Male					
	Hawaii	Dunn's Hawaii	Samoa	Tonga	Marquesas	Maori
Stature	—1.84	— .04	+ .35	+1.65	—1.05	— .75
Head Length	— .16	—5.59	+2.59	+2.99	+5.19	+8.49
Head Width	—1.91	—7.55	—4.78	—4.78	—6.38	—6.78
Minimum Frontal	+4.92	.....	+ .47	+1.87	+ .27	.....
Face Width	—1.22	—5.53	+ .18	—2.22	—2.52	— .02
Bigonial	+3.42	.....	—3.16	—2.96	+1.74	.....
Face Height	+ .65	—2.06	+6.32	+3.42	— .68	— .78
Nose Height	+1.39	— .62	+5.59	+3.29	—1.11	—1.41
Nose Width	+ .13	+ .82	+ .40	+1.00	— .20	—3.30
Ear Height	— .01	.....	+ .01	— .09	+1.01	.....
Ear Width	+1.17	.....	+2.24	+1.54	— .26	.....
Average Difference	1.53	3.17	2.37	2.35	1.86	3.08
Indices						
Cephalic	— .95	—1.52	—3.66	—3.86	—5.56	—7.26
Fronto-Parietal	+3.88	.....	+2.24	+3.04	+2.84	.....
Cephalo-Facial	+ .32	.....	+2.84	+1.44	+2.14	+3.94
Zygomatico-Frontal	+4.07	.....	+ .24	+2.44	+1.34	.....
Zygomatico-Gonial	+3.05	.....	—2.31	— .81	+2.79	.....
Facial	+1.01	+1.94	+4.17	+3.47	+1.27	— .63
Nasal	—1.91	+2.62	—6.72	—2.72	+1.58	—4.42
Ear	+1.74	.....	+3.30	+2.40	—1.10	.....
Average Difference	2.12	2.03	3.185	2.52	2.33	4.06
Total Average Difference	1.78	2.83	2.71	2.42	2.05	3.43

TABLE XXXII. DIFFERENCES FROM THE SOCIETY ISLANDS MEANS

	Female				
	Hawaii	Dunn's Hawaii	Samoa	Tonga	Marquesas
Stature	—2.07	+1.47	+ .08	+1.38	— .42
Head Length	+1.36	— .06	+4.15	+5.25	+4.35
Head Width	—1.63	—3.87	—6.03	—4.13	—4.03
Minimum Frontal	+4.63	.....	+ .07	+1.57	+ .67
Face Width	—1.96	—2.23	—2.44	—2.84	—3.44
Bigonial	+2.25	.....	—3.60	—3.40	+ .40
Face Height	— .42	—2.26	+2.63	+5.63	—3.97
Nose Height	— .04	— .89	+2.18	+4.58	—3.52
Nose Width	+ .45	+ .97	+1.23	+1.93	+ .43
Ear Height	+ .98	.....	—1.49	+1.81	+ .01
Ear Width	+1.71	.....	+2.01	+1.81	— .39
Average Difference	1.59	1.68	2.36	3.12	1.97
Indices					
Cephalic	—1.52	—2.05	—5.41	—4.61	—4.21
Fronto-Parietal	+3.74	.....	+2.95	+2.85	+2.15
Cephalo-Facial	— .32	.....	+2.19	+ .99	+ .09
Zygomatico-Frontal	+4.24	.....	+1.29	+2.19	+1.99
Zygomatico-Gonial	+2.58	.....	—1.40	—1.40	+2.00
Facial	+1.52	+ .42	+5.15	+6.15	+ .05
Nasal	+1.10	+3.35	— .73	—2.83	+6.57
Ear	+1.84	.....	+4.32	+1.22	— .98
Average Difference	2.11	1.94	2.93	2.78	2.255
Total Average Difference	1.81	1.76	2.60	2.98	2.09

TABLE XXXIII. COMPARISON OF NON-MENSURABLE CHARACTERS OF THE SOCIETY ISLANDERS AND OTHERS

	Male						
	Society	Hawaii	Dunn's Hawaii	Samoa	Tonga	Marquesas	Maori
Hair Form:							
Straight	44.70	69.0	8.39	55.1	41.5	30.5	....
Low waves	27.06	16.0	59.35	27.5	41.5	31.7	....
Deep waves	20.00	11.0		10.1	14.4	6.1	....
Curly	7.06	1.0	28.39	5.8	2.5	26.8	....
Frizzly	1.18	2.0	1.94	1.4	....	4.9	....
Woolly	....	1.0	....	....	....	....	....
Crinkly	....	....	1.29	....	....	....	....
Kinky	....	....	.65	....	....	....	....
Hair Color:							
Black	81.71	87.0	92.16	91.4	94.1	87.5	97.6
Dark brown	4.88	6.0	5.88	4.3	4.2	6.3	2.1
Reddish brown	13.41	2.0	1.31	4.2	1.6	3.8	.2
Brown	....	....	.65	....	....	....	....
Light brown	....	....	....	....	....	....	....
Beard:							
Upper cheeks							
None	60.76	23.0	....	10.1	2.1	63.4	....
Slight	25.32	44.0	....	46.3	15.8	17.1	....
Medium	13.92	22.0	....	31.9	33.7	14.6	....
Marked	....	11.0	....	11.5	48.4	4.9	....
Lower cheeks							
None	59.49	27.0	....	14.5	4.2	49.4	....
Slight	20.25	37.0	....	43.3	37.2	29.6	....
Medium	20.25	24.0	....	23.2	18.1	16.0	....
Marked	....	12.0	....	18.8	40.4	5.0	....
Chin							
None	8.86	5.0	....	....	....	5.1	....
Slight	53.16	20.0	....	23.2	19.4	62.0	....
Medium	37.97	54.0	....	27.5	30.6	20.3	....
Marked	....	21.0	....	49.2	50.0	12.6	....
Moustache							
None	4.17	....	....	....	....	....	....
Slight	62.50	....	....	....	....	....	....
Medium	30.55	....	....	....	....	....	....
Marked	2.78	....	....	....	....	....	....
Body Hair:							
Chest							
None	64.38	36.0	....	59.7	23.4	65.8	....
Slight	21.92	32.0	....	22.3	28.7	21.0	....
Medium	13.70	27.0	....	14.9	25.5	6.6	....
Marked	....	5.0	....	3.0	22.3	6.6	....
Arm							
None	36.84	28.0	....	3.0	....	48.2	....
Slight	42.10	25.0	....	19.1	10.5	28.4	....
Medium	19.74	36.0	....	35.3	43.2	14.8	....
Marked	1.32	11.0	....	42.6	46.3	8.6	....
Leg							
None	22.67	5.0	....	....	....	19.0	....
Slight	49.33	35.0	....	7.2	7.3	53.2	....
Medium	28.00	50.0	....	42.0	66.7	17.7	....
Marked	....	10.0	....	50.7	26.0	10.1	....
Nasal Bridge:							
Low	19.51	21.0	....	21.4	21.7	15.5	....
Medium	75.61	58.0	....	64.3	70.4	78.5	....
High	4.88	21.0	....	14.3	7.8	6.0	....
Axis of Nostrils:							
Ant-posterior	....	3.0	....	2.9	1.7	4.8	....
Oblique	22.35	41.0	....	57.3	78.3	50.6	....
Transverse	77.65	56.0	....	39.7	20.0	44.6	....
Septum:							
Wide	68.83	....	....	....	....	....	....
Medium	24.68	....	....	....	....	....	....
Narrow	6.49	....	....	....	....	....	....
Exposed	54.22	....	....	....	....	....	....
Level	22.89	....	....	....	....	....	....
Hidden	22.89	....	....	....	....	....	....

TABLE XXXIII. COMPARISON OF NON-MEASURABLE CHARACTERS—(Continued)

Forehead:							
Vertical	13.42	44.0	....	40.0	60.3	9.6	....
Moderate	68.29	53.0	....	58.5	38.8	84.3	....
Low	18.29	3.0	....	1.5	.9	6.1	....
Glabella:							
Smooth	4.88	27.0	....	29.4	49.1	14.8	....
Medium	39.02	57.0	....	55.8	42.8	54.3	....
Prominent	56.10	16.0	....	14.7	8.0	30.9	....
Lips:							
Thin	1.19	37.0	....	....	10.3	8.4	....
Medium	88.10	62.0	....	92.8	83.6	65.1	....
Thick	10.71	1.0	....	7.1	6.0	26.5	....
Prognathism:							
None	98.80	81.0	....	56.7	53.3	98.8	....
Medium	1.20	19.0	....	41.6	46.6	1.2	....
Marked	....	....	....	1.4	....	....	....
Chin:							
Prominent	22.22	....	....	....	....	....	....
Medium	75.31	....	....	....	....	....	....
Receding	2.47	....	....	....	....	....	....
Eye Color:							
Black	....	2.0	....	2.9	3.4	1.2	....
Dark brown	83.33	91.0	....	97.1	94.1	91.6	....
Light brown	15.48	6.0	....	....	2.5	....	....
Mixed	1.19	1.0	....	....	....	....	....
Blue	....	....	....	....	....	7.2	....
Sclera:							
Clear	16.87	8.0	....	23.5	18.8	10.3	....
Unclear	83.13	92.0	....	76.5	81.2	89.7	....
Eye Fold:							
Absent	17.86	87.0	....	68.1	56.8	21.7	....
Trace	45.24	9.0	....	27.5	29.7	55.4	....
Medium	29.76	3.0	....	2.8	8.1	19.3	....
Marked	7.14	1.0	....	1.4	5.4	3.6	....
Teeth:							
Incisor Fold							
Laterals							
Absent	16.39	50.0	....	51.5	42.1	61.8	....
Slight	34.43	25.0	....	34.3	42.9	23.5	....
Marked	49.18	25.0	....	14.1	14.9	14.7	....
Mesials							
Absent	14.52	51.0	....	68.2	57.9	59.1	....
Slight	32.26	23.0	....	25.7	29.8	24.2	....
Marked	53.23	26.0	....	6.0	12.3	16.7	....
Position of upper mesial incisors							
^	21.57	....	....	....	....	....	....
—	54.90	....	....	....	....	....	....
∨	23.53	....	....	....	....	....	....
Upper incisors							
Vertical	83.02	....	....	....	....	....	....
Projecting slightly	13.21	....	....	....	....	....	....
Projecting markedly	3.77	....	....	....	....	....	....
Number of cusps on lower second molars							
Right							
4	41.46	....	....	....	....	23.9	....
5	58.54	....	....	....	....	76.1	....
Left							
4	46.51	....	....	....	....	22.5	....
5	53.49	....	....	....	....	77.5	....
Bite							
Under	3.28	....	....	....	....	....	....
Edge to edge	32.79	....	....	....	....	....	....
Slight overbite	34.43	....	....	....	....	....	....
Marked overbite	29.51	....	....	....	....	....	....

TABLE XXXIV. COMPARISON OF NON-MENSURABLE CHARACTERS OF THE SOCIETY ISLANDERS

	Society	Female Hawaii	Samoa	Tonga	Marquesas
Hair Form:					
Straight	44.12	86.0	47.8	34.4	25.7
Low waves	22.06	12.0	39.1	46.9	35.1
Deep waves	19.12	2.0	8.8	12.5	12.2
Curly	8.82	....	....	5.2	18.9
Frizzly	5.88	....	4.3	1.0	6.8
Woolly	....	....	....	....	1.3
Hair Color:			(a)		
Black	77.27	93.0	86.67	87.6	84.2
Dark brown	4.55	1.0	13.33	4.1	6.3
Reddish brown	15.15	3.0	....	7.2	9.5
Brown	1.49	....	....	....	....
Light brown	1.49	....	....	....	....
Gray	1.49	3.0	....	1.0	....
Nasal Bridge:					
Low	50.00	45.0	56.9	30.5	54.8
Medium	50.00	48.0	39.1	67.4	42.5
High	....	7.0	4.3	2.1	2.7
Axis of Nostrils:					
Ant-posterior	....	1.0	....	5.3	1.4
Oblique	17.65	39.0	39.1	69.5	37.0
Transverse	82.35	60.0	60.9	25.3	51.6
Septum:					
Wide	68.75	....	....	....	....
Medium	23.44	....	....	....	....
Narrow	7.81	....	....	....	....
Exposed	55.22	....	....	....	....
Level	26.87	....	....	....	....
Hidden	17.91	....	....	....	....
Forehead:					
Vertical	20.00	77.0	85.7	84.4	32.9
Moderate	75.38	23.0	14.3	15.6	67.1
Low	4.62	....	....	....	....
Glabella:					
Smooth	45.45	89.0	100.00	83.5	78.1
Medium	51.52	11.0	....	15.5	19.2
Prominent	3.03	....	....	1.0	2.7
Lips:					
Thin	....	29.0	4.3	10.3	10.8
Medium	92.65	70.0	91.4	87.6	64.9
Thick	7.35	1.0	4.3	2.1	24.3
Prognathism:					
None	98.53	73.0	69.6	46.4	90.4
Medium	1.47	26.0	30.4	52.6	9.6
Marked	....	1.0	....	1.0	....
Chin:					
Prominent	10.45	....	....	....	....
Medium	89.55	....	....	....	....
Receding	....	....	....	....	....
Eye Color:					
Black	....	4.0	13.0	15.5	....
Dark brown	83.82	92.0	82.6	81.4	90.5
Light brown	16.18	4.0	4.3	2.1	....
Mixed	....	....	....	....	....
Blue	....	....	....	1.0	9.5
Sclera:					
Clear	33.82	19.0	45.4	42.7	31.1
Unclear	66.18	81.0	54.6	57.3	68.9
Eye Fold:					
Absent	8.95	78.0	47.8	53.6	20.3
Trace	35.82	17.0	43.4	26.8	40.5
Medium	34.33	4.0	8.8	14.4	28.4
Marked	20.90	1.0	....	5.2	10.8
Teeth:					
Incisor Fold					
Laterals					
Absent	11.76	46.0	57.1	36.3	81.5
Slight	41.18	26.0	23.8	40.6	14.8
Marked	47.06	28.0	19.0	23.1	3.7
Mesials					
Absent	11.11	48.0	76.2	62.6	75.9
Slight	27.78	23.0	14.3	26.4	16.7
Marked	61.11	29.0	9.5	10.9	7.4
Position of upper mesial incisors					
^	11.76	....	....	....	....
—	50.00	....	....	....	....
∨	38.24	....	....	....	....
Upper incisors					
Vertical	91.43	....	....	....	....
Projecting slightly	8.57	....	....	....	....
Projecting markedly	....	....	....	....	....
Number of cusps on lower second molars					
Right					
4	36.36	....	....	....	33.9
5	63.64	....	....	....	66.1
Left					
4	34.78	....	....	....	30.4
5	65.22	....	....	....	69.6
Bite					
Under	....	....	....	....	....
Edge to edge	27.03	....	....	....	....
Slight overbite	51.35	....	....	....	....
Marked overbite	21.62	....	....	....	....

(a) Percentages recalculated.

INDIVIDUAL RECORDS

KEY TO TABLES

Measurements

1 Number
2 Age
3 Stature
4 Shoulder Height
5 Middle Finger
6 Sitting Height
7 Span
8 Head Length
9 Head Width
10 Minimum Frontal
11 Bigonial
12 Face Width
13 Face Height
14 Nose Height
15 Nose Width
16 Ear Height
17 Ear Width

I Arm-Leg
II Relative Shoulder Height
III Relative Arm Length
IV Relative Leg Length
V Relative Sitting Height
VI Relative Span
VII Relative Trunk
VIII Cephalic Index
IX Fronto-Parietal Index
X Cephalo-Facial Index
XI Zygomatico-frontal Index
XII Zygomatico-gonial Index
XIII Facial Index
XIV Nasal Index
XV Ear Index

Individual Observations

a Hair form; 1, straight; 2, low waves; 3, deep waves; 4, curly; 5, frizzly.
b Hair color; 1, black; 2, dark brown; 3, reddish brown; 4, brown; 5, light brown; 6, gray.
c Hair texture; 1, coarse; 2, medium; 3, fine.
d Beard on upper cheek; 0, none; 1, slight; 2, medium; 3, marked.
e Beard on lower cheek; 0, none; 1, slight; 2, medium.
f Beard on chin; 0, none; 1, slight; 2, medium.
g Moustache; 0, none; 1, slight; 2, medium; 3, marked.
h Hair on chest; 0, none; 1, slight; 2, medium.
i Hair on forearms; 0, none; 1, slight; 2, medium; 3, marked.
j Hair on legs; 0, none; 2, slight; 3, medium.
k Eye color; 1, dark brown; 2, light brown; 3, mixed.
l Sclera; 1, clear; 2, speckled; 3, yellow; 4, dull; 5, bloodshot.
m Eye fold; 0, none; 1, slight; 2, medium; 3, marked.
n Nose bridge; 1, low; 2, medium; 3, high.
o Nasal profile; 1, convex; 2, straight; 3, concave.
p Axis of nostrils; 1, ant-post.; 2, oblique; 3, transverse.
q Septum; 1, wide; 2, medium; 3, narrow; 4, exposed; 5, level; 6, hidden.
r Forehead; 1, vertical moderate slope; 2, low.
s Glabella; 1, smooth; 2, medium; 3, prominent.
t Lips; 1, thin; 2, medium; 3, thick.
u Prognathism; 0, none; 1, medium; 2, marked.
v Chin; 1, prominent; 2, medium; 3, receding.
w Ear lobe; 0, none; 1, small separate; 2, small attached; 3, large separate; 4, large attached.
x Helix; 1, rolled first third; 2, rolled second third; 3, rolled entire; 4, flat.
y Darwin's point; 1, present; 2, absent.

TABLE XXXV. INDIVIDUAL MEASUREMENTS—MALE

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
								TAHITI								
1	18	171	142	62	92	178	185	163	100	102	140	120	51	45	55	33
2	19	178	152	68	88	187	172	161	103	101	143	129	58	43	57	31
3	20	173	144	63	86	181	190	156	100	105	142	122	53	42	67	31
4	20	168	142	63	89	173	200	160	110	117	147	138	53	47	68	34
5	22	166	138	62	83	171	180	160	100	93	139	130	52	41	58	30
6	22	167	141	65	89	171	181	164	106	96	148	131	53	43	61	35
7	22	157	132	57	82	166	175	147	95	99	131	116	48	40	61	26
8	23	178	152	67	92	193	200	163	102	111	147	127	57	44	66	35
9	23	164	137	64	87	172	172	147	94	103	131	124	52	39	66	36
10	24	166	137	62	88	173	190	166	105	109	149	120	54	45	68	36
11	25	183	151	67	95	192	190	167	110	115	143	126	57	42	62	33
12	31	180	154	75	94	184	192	165	94	106	155	126	50	46	65	34
13	34	176	146	68	84	177	183	166	110	117	148	125	55	43	63	35
14	34	162	136	61	86	170	180	162	108	105	152	114	53	42	58	31
15	38	176	149	71	90	179	196	173	100	103	153	125	60	46	65	35
16	42	171	142	65	87	176	190	162	105	104	147	125	59	41	61	32
17	59	176	147	64	89	186	180	165	102	100	105	126	49	46	70	36
18	60	165	140	63	83	173	180	156	104	100	143	123	54	47	69	31
								BORABORA								
19	30	167	137	57	89	178	195	155	105	111	145	121	51	43	66	31
20	37	180	152	68	94	188	192	160	89	107	145	120	51	42	71	32
21	39	178	150	71	96	185	195	162	105	112	153	132	53	47	70	34
22	45	167	138	65	92	165	188	155	105	112	143	121	51	48	71	37
23	49	177	149	68	93	192	200	160	105	105	150	134	56	42	70	37
24	49	178	117	61	93	196	188	161	107	109	142	126	55	43	71	34
25	51	166	139	58	88	181	190	155	105	105	146	127	60	45	69	35
26	60	166	139	63	89	175	184	162	106	102	147	125	54	46	69	34
27	....	171	141	64	89	182	174	163	102	114	143	130	55	47	65	27
								RAIATEA								
28	18	178	147	63	90	192	180	158	97	104	140	118	48	42	70	37
29	19	165	136	57	87	181	187	158	96	110	142	118	49	43	61	32
30	26	174	147	69	92	175	197	157	102	110	143	127	52	45	64	33
31	27	177	151	73	89	180	190	147	102	106	144	118	51	38	63	32
32	30	179	151	70	93	186	185	155	100	104	143	125	50	41	64	32
33	32	181	152	70	95	183	185	162	106	94	145	130	55	39	64	31
34	42	173	144	67	87	177	182	161	107	115	147	131	49	48	69	34
35	60	166	139	61	88	177	189	161	108	114	147	128	57	46	71	37
36	60	170	141	63	89	174	191	156	100	107	145	113	53	48	73	35
								MAUPITI								
37	21	171	140	61	92	182	189	162	105	107	152	121	56	39	64	35
38	39	181	153	66	90	192	185	163	94	107	147	120	51	42	64	34
39	42	170	141	65	90	174	198	156	100	107	154	122	47	43	69	32
40	48	164	137	57	89	179	186	158	100	111	140	127	54	45	63	36
41	50	166	138	59	84	177	193	155	100	95	148	111	51	46	65	31
42	53	167	140	60	92	172	189	167	105	116	151	114	53	44	67	32
43	55	161	132	57	86	172	180	160	97	102	142	119	54	47	65	31
44	60	177	150	62	96	184	189	163	100	117	155	126	60	45	70	36
45	88	182	154	....	89	.....	190	161	104	111	150	127	59	42	69	31

TABLE XXXV—Continued

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
								Huahine								
46	20	159	134	62	80	165	193	158	105	100	141	119	54	44	63	31
47	25	172	142	63	90	180	193	155	100	107	137	120	49	42	61	30
48	27	174	145	64	93	182	189	164	103	105	150	133	61	48	70	35
49	32	169	142	61	89	183	195	150	100	105	143	121	54	44	61	30
50	33	166	140	58	88	176	185	155	92	101	140	120	48	41	65	29
51	48	173	144	60	90	188	185	156	112	109	149	135	60	48	67	35
52	56	172	143	62	83	180	183	158	105	103	139	122	51	41	71	29
								Moorea								
53	18	171	144	65	91	176	188	160	107	110	146	118	51	41	68	32
54	20	174	143	64	92	183	186	166	108	111	147	126	57	44	67	37
55	24	167	140	58	87	175	187	157	103	113	142	124	57	37	63	34
56	35	161	134	60	86	169	184	157	107	112	146	122	54	42	64	32
57	46	159	133	53	83	172	185	153	103	92	140	112	51	41	67	33
58	48	167	139	60	90	172	184	160	99	111	148	130	57	44	76	38
59	50	177	148	66	90	187	203	168	105	106	150	130	59	45	69	34
								Mixed Society Islands								
60	18	165	137	61	88	173	196	146	95	100	138	113	50	43	63	30
61	18	177	147	65	94	188	180	158	99	107	140	114	52	41	62	34
62	21	179	146	60	94	192	180	158	114	120	147	121	53	48	69	33
63	23	169	139	64	94	171	185	163	113	111	145	129	59	43	63	32
64	25	172	143	62	88	184	190	163	110	109	151	131	54	41	65	32
65	26	168	140	64	86	180	192	153	100	113	142	129	54	39	56	28
66	28	172	143	65	88	170	180	155	102	103	142	131	57	42	61	32
67	28	174	149	63	86	190	193	162	105	111	144	128	56	38	65	33
68	29	171	147	64	91	182	178	156	100	115	145	132	59	41	67	32
69	29	163	136	60	86	172	176	160	100	113	141	126	55	41	63	32
70	30	174	147	62	87	185	193	162	102	111	149	124	56	42	65	32
71	34	169	141	61	90	177	194	158	105	113	145	135	55	42	60	30
72	35	172	145	62	89	180	185	165	107	115	145	131	58	40	64	33
73	37	171	145	66	88	175	190	160	105	115	144	111	56	41	63	33
74	38	171	144	66	88	180	187	164	100	110	150	134	62	48	63	32
75	39	173	145	63	91	188	193	153	96	103	140	115	56	41	71	35
76	41	182	155	68	91	191	190	161	103	104	142	132	58	48	75	37
77	44	164	137	63	87	171	190	167	113	110	160	133	57	47	66	33
78	45	174	147	62	88	193	192	158	97	100	146	126	57	43	72	34
79	46	173	144	65	94	179	193	161	115	115	155	118	46	48	64	34
80	46	168	141	57	87	184	193	155	103	107	151	137	56	44	71	33
81	50	174	147	64	93	189	196	163	110	121	150	121	52	47	75	32
82	53	173	142	59	91	186	193	162	101	111	150	130	55	43	68	32
83	57	170	141	62	93	181	198	159	105	110	145	127	55	44	73	33
84	57	178	150	66	97	189	190	163	100	110	147	130	57	43	69	33
85	68	179	150	62	93	189	187	166	100	108	152	132	57	41	76	33

TABLE XXXVI. INDIVIDUAL INDICES—MALE

1	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV
							TAHITI								
1	101.27	83.04	46.78	46.20	53.80	104.09	36.84	88.11	61.35	85.89	71.43	72.86	85.71	88.24	60.00
2	93.33	85.39	47.19	50.56	49.44	105.06	34.83	93.60	63.98	88.82	72.03	70.63	90.21	74.14	54.39
3	93.10	83.24	46.82	50.29	49.71	104.62	32.95	82.11	64.10	91.03	70.42	73.94	85.92	79.25	46.27
4	100.00	84.52	47.02	47.02	52.98	102.98	37.50	80.00	68.75	91.88	74.83	79.59	93.88	88.68	50.00
5	91.57	83.13	45.78	50.00	50.00	103.01	33.13	88.89	62.50	86.88	71.94	66.91	93.53	78.85	51.72
6	97.44	84.43	45.51	46.71	53.29	102.40	37.72	90.61	64.63	90.24	71.62	64.86	88.51	81.13	57.38
7	100.00	84.08	47.77	47.77	52.23	105.73	36.31	84.00	64.63	89.12	72.52	75.57	88.55	83.33	42.62
8	98.84	85.39	47.75	48.31	51.69	108.43	37.08	81.50	62.58	90.18	69.39	75.51	86.39	77.19	53.03
9	94.81	83.54	44.51	46.95	53.05	104.88	36.59	85.47	63.94	89.12	71.76	78.63	94.66	75.00	54.55
10	96.15	82.53	45.18	46.99	53.01	104.22	35.54	87.37	63.25	89.76	70.47	73.15	80.54	83.33	52.94
11	95.45	82.51	45.90	48.09	51.91	104.92	34.43	87.89	65.87	85.63	76.92	80.42	88.11	73.68	53.23
12	91.86	85.56	43.89	47.78	52.22	102.22	37.78	85.94	56.97	93.94	60.65	68.39	81.29	92.00	52.31
13	84.78	82.95	44.32	52.27	47.73	100.57	30.68	90.71	66.27	89.16	74.32	79.05	84.46	78.18	55.56
14	98.68	83.95	46.30	46.91	53.09	104.94	37.04	90.00	66.67	93.83	71.05	69.08	75.00	79.25	53.45
15	90.70	84.66	44.32	48.86	51.14	101.70	35.80	88.27	57.80	88.44	65.36	67.32	81.70	76.67	53.85
16	91.67	83.04	45.03	49.12	50.88	102.92	33.92	85.26	64.81	90.74	71.43	70.75	85.03	69.49	52.46
17	95.40	83.52	47.16	49.43	50.57	105.68	34.09	91.67	61.82	93.94	65.81	64.52	81.29	93.88	51.43
18	93.90	84.85	46.67	49.70	50.30	104.85	35.15	86.67	66.67	91.67	72.73	69.93	86.01	87.04	44.93
							BORABORA								
19	102.56	82.04	47.90	46.71	53.29	106.59	35.33	79.49	67.74	93.55	72.41	76.55	83.45	84.31	46.97
20	97.67	84.44	46.67	47.78	52.22	104.44	36.67	83.33	55.63	90.63	61.38	73.79	86.90	82.35	45.07
21	96.34	84.27	44.38	46.07	53.93	103.93	38.20	83.08	64.81	94.44	68.63	73.20	86.21	88.68	48.57
22	97.33	82.63	43.71	44.91	55.09	98.80	37.72	82.45	67.74	92.26	73.43	78.32	84.62	94.12	52.11
23	96.43	84.18	45.76	47.46	52.54	108.47	36.72	80.00	65.63	93.75	70.00	70.00	89.33	75.00	52.86
24	.....	.....	.....	47.75	52.25	110.11	.....	85.64	66.46	88.20	75.35	76.76	88.73	78.18	47.89
25	103.85	83.73	48.80	46.99	53.01	109.04	36.75	81.58	67.74	94.19	71.92	71.92	86.99	75.00	50.72
26	98.70	83.73	45.78	46.39	53.61	105.42	37.35	88.04	65.43	90.74	72.11	69.39	85.03	85.19	49.28
27	93.90	82.46	45.03	47.95	52.05	106.43	34.50	93.68	62.58	87.73	71.33	79.72	90.91	85.45	41.54
							RAIATEA								
28	95.45	82.58	47.19	49.44	50.56	107.87	33.15	87.78	61.39	88.61	69.29	74.29	84.29	87.50	52.86
29	101.28	82.42	47.88	47.27	52.73	109.70	35.15	84.49	60.76	89.87	67.61	77.46	83.10	87.76	52.46
30	95.12	84.48	44.83	47.13	52.87	100.57	37.36	79.70	64.97	91.08	71.33	76.92	88.81	86.54	51.56
31	88.64	85.31	44.07	49.72	50.28	101.69	35.59	77.37	69.39	97.96	70.83	73.61	81.94	74.51	50.79
32	94.19	84.36	45.25	48.04	51.96	103.91	36.31	83.78	64.52	92.26	69.93	72.73	87.41	82.00	50.00
33	95.35	83.98	45.30	47.51	52.49	101.10	36.46	87.57	65.43	89.51	73.10	64.83	89.66	70.91	48.44
34	89.53	83.24	44.51	49.71	50.29	102.31	33.53	88.46	66.46	91.30	72.79	78.23	89.12	97.96	49.28
35	100.00	83.73	46.99	46.99	53.01	106.63	36.75	85.19	67.50	91.30	73.47	77.55	87.07	80.70	52.11
36	96.30	82.94	45.88	47.65	52.35	102.35	35.29	81.68	64.10	92.95	68.97	73.79	77.93	90.57	47.95
							MAUPITI								
37	100.00	81.87	46.20	46.20	53.80	106.43	35.67	85.71	64.81	93.83	69.08	70.39	79.61	69.64	54.69
38	95.60	84.53	48.07	50.28	49.72	106.08	34.25	88.11	57.67	90.18	63.95	72.79	81.63	82.35	53.13
39	95.00	82.94	44.71	47.06	52.94	102.35	35.88	78.79	64.10	98.72	64.94	69.48	79.22	91.49	46.38
40	106.67	83.54	48.78	45.73	54.27	109.15	37.80	84.95	63.29	88.61	71.43	79.29	90.71	83.33	57.14
41	96.34	83.13	47.59	49.40	50.60	106.63	33.73	80.31	64.52	95.48	67.57	64.19	75.00	90.20	47.69
42	106.67	83.83	47.90	44.91	55.09	102.99	38.92	88.36	62.87	90.42	69.54	76.82	75.50	83.02	47.76
43	100.00	81.99	46.58	46.58	53.42	106.83	35.40	88.89	60.63	88.75	68.31	71.83	83.80	87.04	47.69
44	108.64	84.75	49.71	45.76	54.24	103.95	38.98	86.24	61.35	95.09	64.52	75.48	81.29	75.00	51.43
45	.....	84.62	.....	51.10	48.90	.....	33.52	84.74	64.60	93.17	69.33	74.00	84.67	71.19	44.93
							HUAHINE								
46	91.14	84.28	45.28	49.69	50.31	103.77	34.59	81.87	66.46	89.24	74.47	70.92	84.40	81.48	49.21
47	96.34	82.56	45.93	47.67	52.33	104.65	34.88	80.31	64.52	88.39	72.99	78.10	87.59	85.71	49.18
48	100.00	83.33	46.55	46.55	53.45	104.60	36.78	86.77	62.80	91.46	68.67	70.00	88.67	78.69	50.00
49	101.25	84.02	47.93	47.34	52.66	108.28	36.69	76.92	66.67	95.33	69.93	73.43	84.62	81.48	49.18
50	105.13	84.34	49.40	46.99	53.01	106.02	37.35	83.78	59.35	90.32	65.71	72.14	85.71	85.42	44.62
51	101.20	83.24	48.55	47.98	52.02	108.67	35.26	84.32	71.79	95.51	75.17	73.15	90.60	80.00	52.24
52	91.01	83.14	47.09	51.74	48.26	104.65	31.40	86.34	66.46	87.97	75.54	74.10	87.77	80.39	40.85
							MOOREA								
53	98.75	84.21	46.20	46.78	53.22	102.92	37.43	85.11	66.88	91.25	73.29	75.34	80.82	80.39	47.06
54	96.34	82.18	45.40	47.13	52.87	105.17	35.06	89.25	65.06	88.55	73.47	75.51	85.71	77.19	55.22
55	102.50	83.83	49.10	47.90	52.10	104.79	35.93	83.96	65.61	90.45	72.54	79.58	87.32	64.91	53.97
56	98.67	83.23	45.96	46.58	53.42	104.97	36.65	85.33	68.15	92.99	73.29	76.71	83.56	77.78	50.00
57	105.26	83.65	50.31	47.80	52.20	108.18	35.85	82.70	67.32	91.50	73.57	65.71	80.00	80.39	49.25
58	102.60	83.23	47.31	46.11	53.89	102.99	37.13	86.96	61.88	92.50	66.89	75.00	87.84	77.19	50.00
59	94.25	83.62	46.33	49.15	50.85	105.65	34.46	82.76	62.50	89.29	70.00	77.33	86.67	76.27	49.28

TABLE XXXVI, *continued*

1	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV
							MIXED SOCIETY								
60	98.70	83.03	46.06	46.67	53.33	104.85	36.36	74.49	65.07	94.52	68.84	72.46	81.88	86.00	47.62
61	98.80	83.05	46.33	46.89	53.11	106.21	36.16	87.78	62.66	88.61	70.71	76.43	81.43	78.85	54.84
62	101.18	81.56	48.04	47.49	52.51	107.26	34.08	87.78	72.15	93.04	77.55	81.63	82.31	90.57	47.83
63	100.00	82.25	44.38	44.38	55.62	101.18	37.87	88.11	69.33	88.96	77.93	76.55	88.97	72.88	50.79
64	96.43	83.14	47.09	48.84	51.16	106.98	34.30	85.79	67.48	92.64	72.85	72.19	86.75	75.93	49.23
65	92.68	83.33	45.24	48.81	51.19	107.14	34.52	79.69	65.36	92.81	70.42	79.58	90.85	72.22	50.00
66	92.86	83.14	45.35	48.84	51.16	98.84	34.30	86.11	65.81	91.61	71.83	72.54	92.25	73.68	52.46
67	97.73	85.63	49.43	50.57	49.43	109.20	35.06	83.94	64.81	88.89	72.92	77.08	88.89	67.86	50.77
68	103.75	85.96	48.54	46.78	53.22	106.43	39.18	87.64	64.10	92.95	68.97	79.31	91.03	69.49	47.76
69	98.70	83.44	46.63	47.24	52.76	105.52	36.20	90.91	62.50	88.13	70.92	80.14	89.36	74.55	50.79
70	97.70	84.48	48.85	50.00	50.00	106.32	34.48	83.94	62.96	91.98	68.46	74.50	83.22	75.00	49.23
71	101.27	83.43	47.34	46.75	53.25	104.73	36.69	81.44	66.46	91.77	72.41	77.93	93.10	76.36	50.00
72	100.00	84.30	48.26	48.26	51.74	104.65	38.05	89.19	64.85	87.88	73.79	79.31	90.34	68.97	51.56
73	95.18	84.80	46.20	48.54	51.46	102.34	36.26	84.21	65.63	90.00	72.92	79.86	77.08	73.21	52.38
74	93.98	84.21	45.61	48.54	51.46	105.26	35.67	87.70	60.98	91.46	66.67	73.33	89.33	77.42	50.79
75	100.00	83.82	47.40	47.40	52.60	108.67	36.42	79.27	62.75	91.50	68.57	73.57	82.14	73.21	49.30
76	95.60	85.16	47.80	50.00	50.00	104.95	35.16	84.74	63.98	88.20	72.54	73.24	92.96	82.76	49.33
77	96.10	83.54	45.12	46.95	53.05	104.27	36.59	87.89	67.66	95.81	70.63	68.75	83.13	82.46	50.00
78	98.84	84.48	48.85	49.43	50.57	110.92	35.06	82.29	61.39	92.41	66.44	68.49	86.30	75.44	47.22
79	100.00	83.24	45.66	45.66	54.34	103.47	37.57	83.42	71.43	96.27	74.19	74.19	76.13	104.35	53.13
80	103.70	83.93	50.00	48.21	51.79	109.52	35.71	80.31	66.45	97.42	68.21	70.86	90.73	78.57	46.48
81	102.47	84.48	47.70	46.55	53.45	108.62	37.92	83.16	67.48	92.02	73.33	80.67	80.67	90.38	42.67
82	101.22	82.08	47.98	47.40	52.60	107.51	34.68	83.94	62.35	92.59	67.33	74.00	86.67	78.18	47.06
83	102.60	82.94	46.47	45.29	54.71	106.47	37.65	80.30	66.04	91.19	72.41	75.86	87.59	80.00	45.21
84	103.70	84.27	47.19	45.51	54.49	106.18	38.76	85.79	61.35	90.18	68.03	74.83	88.44	75.44	47.83
85	102.33	83.80	49.16	48.04	51.96	105.59	37.75	88.77	60.24	91.57	65.79	71.05	86.84	71.93	43.42

TABLE XXXVII. INDIVIDUAL MEASUREMENTS—FEMALE

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
								Tahiti								
134	18	159	133	60	83	171	180	161	110	105	148	115	48	44	55	32
135	20	153	127	55	79	.....	177	155	98	90	140	120	55	43	66	33
136	23	169	143	68	94	172	188	162	106	103	145	124	56	44	60	30
137	24	158	130	62	86	151	184	150	101	101	141	114	50	43	56	30
138	24	163	137	64	81	163	174	161	105	95	145	117	52	42	69	33
139	24	150	127	....	80	.....	175	146	97	103	130	116	53	35	59	29
140	27	163	135	60	86	164	181	157	102	99	134	126	52	37	57	30
141	28	157	134	61	80	163	181	150	102	90	133	113	51	35	56	28
142	30	169	143	67	87	167	178	159	107	108	137	119	52	42	50	34
143	30	165	137	63	85	162	180	150	107	100	141	116	50	40	61	30
144	31	172	144	63	91	175	190	160	110	106	143	129	67	43	62	29
145	33	163	136	65	87	165	162	146	99	109	136	120	51	39	63	30
146	35	160	135	63	83	161	182	162	102	113	143	117	53	43	64	33
147	36	157	130	61	83	157	170	151	97	107	143	114	53	35	61	25
148	37	168	140	62	89	173	183	161	106	115	140	122	53	43	66	32
149	41	158	131	57	85	159	182	157	102	93	146	115	48	44	63	33
150	49	163	137	61	84	173	177	156	97	91	143	129	55	36	69	34
151	50	158	132	61	81	157	178	158	93	105	141	109	53	40	67	38
152	62	160	137	60	82	170	184	162	98	112	145	129	57	44	62	33
153	...	155	130	61	80	157	160	149	100	99	130	116	50	37	59	28
								Huahine								
102	18	160	133	62	88	162	180	156	103	109	142	121	51	36	64	30
103	27	164	139	65	86	164	175	152	108	108	140	116	48	36	65	27
104	30	159	132	60	87	157	177	153	103	108	148	117	50	38	62	31
105	30	158	133	61	83	162	175	146	100	94	135	111	47	42	58	32
106	37	164	139	61	87	171	185	147	100	102	136	117	51	40	67	31
107	40	159	134	57	83	166	184	149	100	107	132	116	53	38	59	32
108	41	165	144	61	64	173	182	153	107	101	141	117	50	39	64	35
109	50	163	138	62	83	166	178	150	95	96	133	111	55	38	57	29
110	59	162	136	63	86	164	177	153	100	107	135	129	62	45	67	35
								Moorea								
126	15	156	131	61	79	153	170	147	100	88	125	108	48	37	58	31
127	24	159	133	64	84	159	175	163	112	100	142	118	55	35	60	31
128	31	165	137	66	82	164	180	155	111	109	145	111	52	40	62	31
129	44	156	130	58	79	156	191	161	103	96	145	132	58	45	65	34
130	50	158	133	57	84	169	176	154	95	100	131	120	54	38	64	32
131	53	152	128	55	81	165	175	153	105	104	135	123	52	39	72	37
132	60	158	133	58	79	168	185	155	100	109	144	133	61	51	65	39
133	....	155	129	60	80	156	179	160	106	104	133	111	56	43	66	31
								Borabora								
111	30	160	135	62	86	162	170	160	147	107	150	107	45	47	59	32
112	30	163	137	63	82	170	182	160	106	103	137	128	52	40	65	33
113	39	153	129	59	81	157	180	155	100	102	136	113	52	40	67	29
								Maupiti								
114	39	168	143	67	90	175	178	153	97	102	135	114	52	38	66	29
115	40	167	141	66	87	168	180	158	101	107	142	114	54	40	66	34
								Raiatea								
116	18	158	136	66	87	160	166	148	100	100	134	114	45	42	59	34
117	19	159	131	56	85	163	182	152	101	105	140	120	50	42	68	30
118	19	166	140	63	87	165	171	146	100	91	136	113	49	38	64	32
119	19	175	147	64	89	182	180	155	100	104	145	127	52	42	74	36
120	20	167	139	66	89	165	178	150	100	95	136	108	52	44	58	33
121	24	161	133	62	87	161	180	148	100	102	135	114	47	37	64	31
122	25	169	141	67	85	167	188	150	95	110	135	109	49	41	62	32
123	26	155	127	60	82	154	183	152	100	113	133	110	48	37	58	30
124	47	156	131	63	83	159	175	156	98	99	140	113	49	42	64	33
125	62	156	131	58	79	165	173	159	99	90	137	114	54	40	64	33
								Mixed Society								
86	20	154	127	53	77	156	167	148	95	104	137	108	47	38	58	28
87	22	162	136	64	79	169	172	155	100	103	137	121	48	36	66	29
88	22	163	137	61	86	169	190	153	96	94	139	125	53	32	70	33
89	24	163	139	64	85	171	190	147	105	93	135	115	51	39	58	30
90	24	164	138	64	88	172	175	145	100	97	134	122	57	37	55	31
91	24	170	141	65	86	171	181	155	100	102	137	122	55	38	65	30
92	25	158	131	61	86	162	176	152	100	107	136	110	55	36	66	30
93	27	161	133	60	64	.....	180	174	107	109	141	126	52	38	66	25
94	32	163	139	67	89	163	175	160	100	95	145	104	51	41	60	32
95	33	162	132	61	86	173	191	146	100	106	139	124	56	39	52	31
96	33	153	128	58	85	161	185	151	100	113	141	115	51	40	62	31
97	37	171	142	67	89	168	176	153	97	107	140	123	57	40	62	31
98	40	161	140	63	87	168	180	152	100	106	145	110	50	43	70	34
99	42	164	136	63	88	169	186	157	107	116	144	128	51	38	58	36
100	45	155	135	64	86	161	180	155	95	94	140	116	53	42	67	31
101	51	166	140	65	83	172	182	156	110	115	141	114	45	42	70	33

TABLE XXXVIII. INDIVIDUAL INDICES—FEMALE

1	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV
							TAHITI								
134	96.05	83.65	45.91	47.80	52.20	107.55	35.85	89.44	68.32	91.93	74.32	70.95	77.70	91.67	58.18
135	97.30	83.01	47.06	48.37	51.63	.....	34.64	87.57	63.23	90.32	70.00	64.29	85.71	78.18	50.00
136	100.00	84.62	44.38	44.38	55.62	101.78	40.24	86.17	65.43	89.51	73.10	71.03	85.52	78.57	50.00
137	94.44	82.28	43.04	45.57	54.43	95.57	36.71	81.52	67.33	94.00	71.63	71.63	80.85	86.00	53.57
138	89.02	84.05	44.79	50.31	49.69	100.00	33.74	92.53	65.22	90.06	72.41	65.52	80.69	80.77	47.83
139	.....	84.67	.....	46.67	53.33	.....	38.00	83.43	66.44	89.04	74.62	79.23	89.23	66.04	49.15
140	97.40	82.82	46.01	47.24	52.76	100.61	35.58	86.74	64.97	85.35	76.12	73.88	94.03	71.15	52.63
141	94.81	85.35	46.50	49.04	50.96	103.82	36.31	82.87	68.00	88.67	76.69	67.67	84.96	68.63	50.00
142	92.68	84.62	44.97	48.52	51.48	98.82	36.09	89.33	67.30	86.16	78.10	78.83	86.86	80.77	68.00
143	92.50	83.03	44.85	48.48	51.52	98.18	34.55	83.33	71.33	94.00	75.89	70.92	82.27	80.00	49.18
144	100.00	83.72	47.09	47.09	52.91	101.74	36.63	84.21	68.75	89.38	76.92	74.13	90.21	64.18	46.77
145	93.42	83.44	43.56	46.63	53.37	101.23	36.81	90.12	67.81	93.15	72.79	80.15	88.24	76.47	47.62
146	93.51	84.38	45.00	48.13	51.88	100.63	36.25	89.01	62.96	88.27	71.33	79.02	81.82	81.13	51.56
147	93.24	82.80	43.95	47.13	52.87	100.00	35.67	88.82	64.24	94.70	67.83	74.83	79.72	66.04	40.98
148	98.73	83.33	46.43	47.02	52.98	102.98	36.31	87.98	65.84	86.96	75.71	82.14	87.14	81.13	48.48
149	101.37	82.91	46.84	46.20	53.80	100.63	36.71	86.26	64.97	92.99	69.86	63.70	78.77	91.67	52.38
150	96.20	84.05	46.63	48.47	51.53	106.13	35.58	88.14	62.18	91.67	67.83	63.64	90.21	65.45	49.28
151	92.21	83.54	44.94	48.73	51.27	99.37	34.81	88.76	58.86	89.24	65.96	74.47	77.30	75.47	56.72
152	98.72	85.63	48.13	48.75	51.25	106.25	36.88	88.04	60.49	89.51	67.59	77.24	88.97	77.19	53.23
153	92.00	83.87	44.52	48.39	51.61	101.29	35.48	93.13	67.11	87.25	76.92	76.15	89.23	74.00	47.46
							HUAHINE								
102	98.61	83.13	44.38	45.00	55.00	101.25	38.13	86.67	66.03	91.03	72.54	76.76	85.21	70.59	46.88
103	94.87	84.76	45.12	47.56	52.44	100.00	37.20	86.86	71.05	92.11	77.14	77.14	82.86	75.00	41.54
104	91.67	83.02	41.51	45.28	54.72	98.74	37.74	86.44	67.32	96.73	69.59	72.97	79.05	76.00	50.00
105	96.00	84.18	45.57	47.47	52.53	102.53	36.71	83.43	68.49	92.47	74.07	69.63	82.22	89.36	55.17
106	101.30	84.76	47.56	46.95	53.05	104.27	37.80	79.46	68.03	92.52	73.53	75.00	86.03	78.43	46.27
107	101.32	84.28	48.43	47.80	52.20	104.40	36.48	80.98	67.11	88.59	75.76	81.06	87.88	71.70	54.24
108	.....	87.27	50.30	.....	.....	104.85	.....	84.07	69.93	92.16	75.89	71.63	82.98	78.00	54.69
109	95.00	84.66	46.63	49.08	50.92	101.84	35.58	84.27	63.33	88.67	71.43	72.18	83.46	69.09	50.88
110	96.05	83.95	45.06	46.91	53.09	101.23	37.04	86.44	65.36	88.24	74.07	79.26	95.56	72.58	52.24
							MOOREA								
126	90.91	83.97	44.87	49.36	50.64	98.08	34.62	86.47	68.03	85.03	80.00	70.40	86.40	77.08	53.45
127	92.00	83.65	43.40	47.17	52.83	100.00	36.48	93.14	68.71	87.12	78.87	70.42	83.10	63.64	51.67
128	85.54	83.03	43.03	50.30	49.70	99.39	32.73	86.11	71.61	93.55	76.55	75.17	76.55	76.92	50.00
129	93.51	83.33	46.15	49.36	50.64	100.00	33.97	84.29	63.98	90.06	71.03	66.21	91.03	77.59	52.31
130	102.70	84.18	48.10	46.84	53.16	106.96	37.34	87.50	61.69	85.06	72.52	76.34	91.60	70.37	50.00
131	102.82	84.21	48.03	46.71	53.29	108.55	37.50	87.43	68.63	88.24	77.78	77.04	91.11	75.00	51.39
132	94.94	84.18	47.47	50.00	50.00	106.33	34.18	83.78	64.52	92.90	69.44	75.69	92.36	83.61	60.00
133	92.00	83.23	44.52	48.39	51.61	100.65	34.84	89.39	66.25	83.13	79.70	78.20	83.46	76.79	46.97
							BORABORA								
111	98.65	84.38	45.63	46.25	53.75	101.25	38.13	94.12	91.88	93.75	.....	71.33	71.33	104.44	54.24
112	91.36	84.05	45.40	49.69	50.31	104.29	34.36	87.91	66.25	85.63	77.37	75.18	93.43	76.92	50.77
113	97.22	84.31	45.75	47.06	52.94	102.61	37.25	86.11	64.52	87.74	73.53	75.00	83.09	76.92	43.28
							MAUPITI								
114	97.44	85.12	45.24	46.43	53.57	104.17	38.69	85.96	63.40	88.24	71.85	75.56	84.44	73.08	43.94
115	93.75	84.43	44.91	47.90	52.10	100.60	36.53	87.78	63.92	89.87	71.13	75.35	80.28	74.07	51.52
							RAIATEA								
116	98.59	86.08	44.30	44.94	55.06	101.27	41.14	89.16	67.57	90.54	74.63	74.63	85.07	93.33	57.63
117	101.35	82.39	47.17	46.54	53.46	102.52	35.85	83.52	66.45	92.11	72.14	75.00	85.71	84.00	44.12
118	97.47	84.34	46.39	47.59	52.41	99.40	36.75	85.38	68.49	93.15	73.53	66.91	83.09	77.55	50.00
119	96.51	84.00	47.43	49.14	50.86	104.00	34.86	86.11	64.52	93.55	68.97	71.72	87.59	80.77	48.65
120	93.59	83.23	43.71	46.71	53.29	98.80	36.53	84.27	66.67	90.67	73.53	69.85	79.41	84.62	56.90
121	95.95	82.61	44.10	45.96	54.04	100.00	36.65	82.22	67.57	91.22	74.07	75.56	84.44	78.72	48.44
122	88.10	83.43	43.79	49.70	50.30	98.82	33.73	79.79	63.33	90.00	70.37	81.48	80.74	83.67	51.61
123	91.78	81.94	43.23	47.10	52.90	99.35	34.84	83.06	65.79	87.50	75.19	84.96	82.71	77.08	51.72
124	93.15	83.97	43.59	46.79	53.21	101.92	37.18	89.14	62.82	89.74	70.00	70.71	80.71	85.71	51.56
125	94.81	83.97	46.79	49.36	50.64	105.77	34.62	91.91	62.26	86.16	72.26	65.69	83.21	74.07	51.56
							MIXED SOCIETY								
86	96.10	82.47	48.05	50.00	50.00	101.30	32.47	88.62	64.19	92.57	69.34	75.91	78.83	80.85	48.28
87	86.75	83.95	44.44	51.23	48.77	104.32	32.72	90.12	64.52	88.39	72.99	75.18	88.32	75.00	43.94
88	98.70	84.05	46.63	47.24	52.76	103.68	36.81	80.53	62.75	90.85	69.06	67.63	89.93	60.38	47.14
89	96.15	85.28	46.01	47.85	52.15	104.91	37.42	77.37	71.43	91.84	77.78	68.89	85.19	76.47	51.72
90	97.37	84.15	45.12	46.34	53.66	104.88	37.80	82.86	68.97	92.41	74.63	72.39	91.04	64.91	56.36
91	90.48	82.94	44.71	49.41	50.59	100.59	33.53	85.64	64.52	88.39	72.99	74.45	89.05	69.09	46.15
92	97.22	82.91	44.30	45.57	54.43	102.53	37.34	86.36	65.79	89.47	73.53	78.68	80.88	65.45	45.45
93	.....	82.61	45.34	.....	.....	.....	.....	96.67	61.49	81.03	75.89	77.30	89.36	73.08	37.88
94	97.30	85.28	44.17	45.40	54.60	100.00	39.88	91.43	62.50	90.63	68.97	65.52	71.72	80.39	53.33
95	93.42	81.48	43.83	46.91	53.09	106.79	34.57	76.44	68.49	95.21	71.94	76.26	89.21	69.64	59.62
96	102.94	83.66	45.75	44.44	55.56	105.23	39.22	81.62	66.23	93.38	70.92	80.14	81.56	78.43	50.00
97	91.46	83.04	43.86	47.95	52.05	98.25	35.09	86.93	63.40	91.50	69.29	76.43	87.86	70.18	50.00
98	104.05	86.96	47.83	45.96	54.04	104.35	40.99	84.44	65.79	95.39	68.97	73.10	75.86	86.00	48.57
99	96.05	82.93	44.51	46.34	53.66	103.05	36.59	84.41	68.15	91.72	74.31	80.56	88.89	74.51	62.07
100	102.90	87.10	45.81	44.52	55.48	103.87	42.58	86.11	61.29	90.32	67.86	67.14	82.86	79.25	46.27
101	90.36	84.34	45.18	50.00	50.00	103.61	34.34	85.71	70.51	90.38	78.01	81.56	80.85	93.33	47.14

XXXIX. INDIVIDUAL OBSERVATIONS—MALE

l	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y
												Tahiti													
1	1	1	3	0	0	0	1	0	0	0	1	4	2	3	2	3	1, 6	1	2	2	0	1	2	2	2
2	1	1	2	0	0	1	1	0	0	0	1	3	0	2	2	3	1, 4	1	2	2	0	2	1	1	2
3	2	2	2	0	0	1	1	0	0	0	1	3	2	1	2	3	1, 4	2	3	2	0	2	1	2	2
4	3	1	1	0	0	1	1	0	0	0	1	4	2	2	2	3	2, 5	1	2	3	0	2	1	1	2
5	1	1	2	0	0	1	1	0	1	1	1	....	2	2	2	3	2, 5	1	2	2	0	2	2	1	2
6	1	1	2	0	0	2	2	1	0	2	1	3	2	1	3	3	2, 5	1	2	3	0	1	2	2	2
7	2	2	1	0	0	1	1	0	2	2	1	3	1	1	2	2	2, 4	1	2	2	0	2	2	2	2
8	2	1	3	2	2	2	2	1	1	1	1	1	1	1	3	3	1, 4	1	3	2	0	1	3	2	2
9	2	3	1	0	0	1	1	0	0	2	1	1	2	1	2	3	1, 6	1	3	3	0	1	1	1	2
10	5	3	1	0	0	1	1	0	0	0	1	1	2	2	2	3	1, 4	1	3	2	0	2	3	2	2
11	3	1	1	1	2	2	2	2	2	2	1	2	1	2	2	2	2, 6	1	3	2	0	1	2	2	2
12	2	1	1	1	1	1	1	0	1	1	1	4	2	1	3	3	1, 4	2	3	2	0	1	1	1	2
13	4	1	3	0	0	1	1	0	1	1	2	....	2	2	2	3	1, 5	1	2	2	0	2	1	1	2
14	3	1	2	2	2	2	2	2	2	2	1	....	1	1	2	3	1, 4	2	3	2	0	2	1	1	2
15	1	1	2	0	0	1	2	1	1	1	1	4	0	2	2	3	1, 4	2	2	2	0	2	1	1	....
16	3	1	2	1	1	2	2	0	1	1	1	....	1	2	2	3	1, 6	2	3	2	0	1	1	1	2
17	1	1	3	0	0	1	2	0	1	1	1	....	1	1	2	3	1, 6	2	3	2	0	1	2	2	2
18	2	1	2	1	1	1	2	0	1	1	1	4	0	1	3	3	1, 4	1	2	2	0	3	1	2	2
												Borabora													
19	2	1	2	1	1	2	1	0	1	2	1	4	1	2	1	2	2, 4	1	1	3	0	1	2	1	2
20	1	1	2	0	0	2	1	0	0	1	1	....	1	2	2	3	1, 6	....	3	2	0	2	2	2	2
21	2	3	3	2	2	2	2	2	2	2	1	3	2	2	2	3	1, 4	1	2	2	0	2	2	2	2
22	2	1	3	1	2	2	1	....	....	....	1	4	0	2	2	3	1	1	2	2	0	2	1	1	2
23	1	1	3	0	0	2	2	0	2	2	1	5	0	2	2	3	1, 6	1	3	3	0	2	1	2	2
24	3	1	2	2	2	2	2	1	2	2	1	2	0	2	2	2	2, 6	1	3	2	....	....	1	1	2
25	1	1	3	0	0	1	1	0	0	0	1	4	1	2	2	3	1, 4	1	2	2	0	2	1	1	2
26	1	1	3	2	2	2	2	2	2	2	1	....	1	2	2	3	1, 4	1	2	2	0	2	1	2	2
27	4	3	3	0	2	2	1	2	2	2	2	5	1	2	2	3	1, 5	1	3	2	0	2	4	1	....
												Raiatea													
28	2	1	3	0	0	0	1	0	0	1	1	2	2	2	2	3	3, 6	1	3	2	0	2	4	1	2
29	4	1.	3	0	0	0	0	1	1	1	1	1	1	2	2	2	1, 4	1	3	2	0	2	1	1	2
30	3	1	3	....	....	1	1	....	1	1	1	1	1	2	2	3	6	1	1	2	0	2	4	2	2
31	3	1	2	0	0	1	1	0	1	1	1	2	2	2	2	3	5	....	....	2	0	2	2	1	1
32	3	1	2	0	0	1	1	0	0	0	1	....	1	2	2	2	6	1	2	2	0	2	2	1	2
33	3	1	2	....	....	....	....	....	....	....	1	2	0	2	2	2	4	1	3	2	0	2	1	1	2
34	3	1	3	0	1	2	2	0	1	2	1	5	1	2	2	3	1, 5	1	2	2	0	2	2	2	2
35	1	1	2	0	0	1	....	1	1	1	1	....	1	2	2	3	5	1	1	2	0	2	2	1	2
36	1	1	3	0	0	....	....	0	0	....	1	2	1	1	3	3	1, 4	1	2	2	0	2	3	1	2
												Maupiti													
37	1	1	3	0	0	1	1	0	0	1	1	2	1	2	1	2	3, 5	1	3	2	0	2	2	1	....
38	2	1	1	2	2	2	2	2	2	2	2	1	0	2	2	3	5	1	2	2	0	1	4	1	....
39	1	1	2	2	2	2	....	1	1	1	1	....	1	2	2	2	1, 5	1	3	2	0	2	2	1	2
40	3	1	2	2	2	2	2	1	2	2	2	4	1	2	2	2	2, 4	2	3	2	0	....	1	2	2
41	1	1	3	1	2	2	....	0	1	1	2	4	2	2	2	2	2, 4	1	3	3	0	2	2	1	2
42	2	6	2	0	0	1	....	2	2	2	2	4	2	2	2	3	2	1	2	2	0	2	2	2	2
43	1	1	2	....	....	....	....	1	1	2	1	4	1	....	....	3	1, 4	1	3	2	0	1	2	1	2
44	1	1	3	1	1	1	1	1	1	1	2	4	0	1	2	3	1, 4	1	3	2	0	1	1	2	2
45	1	1	3	0	1	2	....	0	0	0	2	4	1	1	2	2	2, 4	1	3	2	0	....	1	2	2
												Huahine													
46	1	2	3	1	0	1	1	0	1	1	....	....	3	1	2	3	1, 4	....	....	2	0	2	2	2	2
47	1	1	1	0	0	1	1	0	1	1	1	5	3	2	2	3	3, 5	1	3	2	0	2	2	1	2
48	3	3	1	1	1	1	1	0	0	0	1	....	2	2	2	3	2, 6	2	3	2	0	2	1	1	2
49	4	1	1	1	0	1	1	0	1	1	1	5	2	2	2	3	1, 5	2	3	2	0	2	2	1	2
50	2	1	3	1	0	1	1	0	0	1	1	5	3	2	3	3	1, 4	1	3	2	0	2	2	1	2
51	1	1	1	1	1	1	1	1	1	1	1	4	1	2	3	3	1, 5	1	2	1	0	1	1	1	2
52	2	6	....	1	1	1	1	1	1	1	3	1	1	1	2	3	3, 6	1	2	2	0	2	2	2	2
												Moorea													
53	3	1	1	0	0	1	1	0	0	0	1	....	2	2	2	3	1, 4	1	2	2	0	2	1	1	2
54	1	1	3	0	0	1	1	0	0	0	2	2	....	....	....	3	1, 4	1	2	2	0	2	3	2	2
55	1	1	2	0	0	1	1	1	1	1	1	1	2	2	2	2	1, 4	2	3	2	0	1	1	1	2
56	2	1	3	2	2	2	2	2	3	2	1	3	0	2	3	3	1, 4	1	2	2	0	2	1	2	2
57	1	1	3	0	0	1	1	1	1	1	1	5	0	2	2	3	1, 4	1	2	2	0	2	3	1	2
58	1	3	3	0	0	1	1	0	0	0	2	1	1	2	2	3	1, 4	2	3	2	0	2	3	2	2
59	1	1	1	1	1	2	2	2	1	1	1	....	1	2	2	3	1, 4	2	2	....	....	....	3	1	2

TABLE XXXIX, *continued*

												Mixed Society													
1	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y
60	1	1	2	0	0	0	0	....	....	....	1	5	3	1	3	3	4	1	2	2	0	2	2	1	2
61	2	1	3	0	0	0	....	0	0	0	1	2	1	2	2	3	1, 6	1	3	3	1	2	1	1	2
62	2	3	3	0	0	0	0	0	0	0	1	2	1	2	2	3	1, 4	1	3	3	0	2	4	1	2
63	3	1	2	1	0	1	1	....	....	....	1	....	1	3	1	3	1, 5	1	1	2	0	2	1	1	2
64	4	1	1	1	1	1	1	1	1	1	1	5	1	2	2	3	1, 4	1	3	2	0	2	1	1	2
65	1	3	3	....	....	....	....	....	....	....	2	1	2	2	2	3	6	1	3	2	0	2	1	2	2
66	2	3	3	0	0	1	1	1	0	1	2	2	1	2	1	3	2, 5	2	3	2	0	2	2	2	2
67	3	3	3	1	1	2	1	....	....	....	2	1	2	2	2	2	1, 5	2	3	2	0	2	2	1	2
68	3	1	1	0	0	1	1	0	0	0	1	....	3	2	2	2	1, 5	1	3	2	0	2	1	2	2
69	1	1	2	0	0	0	1	0	0	0	1	....	2	2	2	2	2, 4	1	2	2	0	3	2	2	2
70	1	3	2	1	2	2	2	....	....	....	1	1	2	2	2	3	1, 6	1	3	3	0	1	1	2	2
71	1	2	3	0	0	1	1	0	1	1	1	....	1	2	2	3	1, 4	2	3	2	0	2	1	1	....
72	1	1	2	0	0	1	1	0	1	0	1	....	2	2	2	3	1, 4	1	2	2	0	2	2	1	2
73	1	1	3	0	0	1	1	0	0	1	1	....	1	3	2	2	2, 6	1	3	2	0	2	2	1	2
74	2	1	2	....	....	....	....	1	2	2	1	2	1	3	1	2	2, 4	1	2	2	0	2	2	2	2
75	1	1	2	0	0	2	2	0	0	1	1	1	1	2	2	3	1, 4	1	2	2	0	2	1	1	2
76	2	1	1	0	0	1	....	0	1	1	1	2	1	2	2	3	3, 4	1	3	2	0	2	3	1	2
77	1	1	2	0	0	2	2	0	2	2	1	2	1	2	2	3	2, 6	1	2	2	0	2	2	2	2
78	1	1	3	2	2	2	3	2	2	2	1	5	2	2	2	3	1, 5	1	2	2	0	2	1	1	2
79	4	1	3	....	....	....	....	0	2	2	1	5	0	1	2	3	1, 4	1	....	2	0	2	2	1	2
80	1	1	1	2	2	2	3	....	0	1	1	5	2	2	2	3	1, 4	1	3	2	0	2	1	2	2
81	3	1	2	0	1	2	2	0	1	1	1	4	3	2	2	3	2, 4	1	3	2	0	2	2	1	2
82	2	1	3	0	1	1	1	0	0	1	1	1	0	....	....	3	1, 4	1	3	2	0	1	1	2	2
83	1	1	3	0	0	1	1	....	....	....	1	3	1	2	2	3	2, 6	1	3	2	0	2	3	1	2
84	2	1	3	0	0	2	1	....	....	....	1	....	0	2	2	2	1, 4	1	3	2	0	1	1	2	2
85	2	6	2	1	1	2	2	0	1	1	1	....	0	2	2	3	1, 4	1	3	1	0	1	1	2	2

TABLE XL. INDIVIDUAL OBSERVATIONS—FEMALE

1	a	b	c	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y
									Mixed Society									
86	1	1	3	1	4	1	2	2	3	1,5	1	2	2	0	2	3	1	..
87	1	3	3	1	..	2	2	1	3	1,5	2	2	2	0	1	1	1	2
88	3	1	3	1	4	2	2	2	3	1,4	1	1	2	0	2	2	2	2
89	1	1	3	1	1	2	1	3	3	1,6	1	2	2	0	2	3	2	2
90	1	..	3	1	1	2	2	2	2	1,5	1	2	2	0	2	2	1	2
91	1	1	2	1	2	2	..	..	2	1,4	1	2	2	0	2	2	1	2
92	5	1	2	1	3	1	2	2	3	1	1	1	2	0	2	1	1	2
93	1	1	3	1	1	1	1	2	3	2,4	1	1	2	0	1	2	1	2
94	4	1	2	1	1	2	1	3	3	1,4	1	2	2	0	2	3	2	2
95	1	1	3	1	1	1	2	2	3	1,4	1	3	2	0	2	1	1	2
96	4	1	3	1	4	3	1	3	3	1,4	1	2	2	0	2	1	1	2
97	1	1	2	1	..	2	1	2	3	1,4	1	2	2	0	2	2	1	2
98	4	1	3	1	3	3	1	3	3	1,4	1	2	2	0	2	1	1	2
99	2	1	3	2	2	2	2	2	2	1,4	1	1	2	0	2	2	4	2
100	2	1	2	1	..	2	2	2	3	1,5	1	1	2	0	2	2	1	2
101	3	1	3	2	1	0	2	3	3	1,4	1	1	2	0	1	2	1	2
									Huahine									
102	1	3	2	2	1	2	2	2	3	1,4	1	2	2	0	2	2	2	2
103	2	3	2	1	4	3	..	..	2	2,4	1	2	2	0	1	2	1	2
104	1	1	3	1	4	3	1	2	3	1,4	1	1	2	0	2	1	1	2
105	2	3	3	2	2	3	1	3	3	1,4	1	1	2	0	2	1	1	2
106	3	1	3	1	1	1	..	..	3	3,5	1	1	2	0	2	2	1	2
107	3	1	3	1	3	0	1	3	3	3,4	1	2	2	0	2	1	1	..
108	2	1	..	1	..	1	2	2	3	1,5	1	2	2	0	2	2	2	2
109	1	3	..	1	5	1	1	2	3	1,6	1	2	2	0	2	1	1	2
110	3	1	3	1	1	2	2	1	3	1,4	1	1	3	0	2	2	1	2
									Borabora									
111	4	1	3	1	4	2	1	2	3	2,4	1	1	2	0	2	2	2	2
112	3	1	3	1	1	1	2	2	3	1,4	1	1	2	0	1	2	2	2
113	4	1	2	1	1	1	1	2	3	2,4	1	1	2	0	2	1	2	..
									Maupiti									
114	2	1	3	1	1	2	2	1	3	1,5	..	..	2	0	2	1	1	2
115	1	1	3	2	5	3	1	2	2	2,4	1	1	2	0	1	3	2	2
									Raiatea									
116	2	1	3	1	..	3	2	2	3	1,5	1	1	2	0	2	4	2	2
117	3	1	3	1	3	3	2	3	3	4	1	1	2	0	2	4	1	2
118	3	1	1	1	1	3	1	2	3	3,5	1	1	3	0	2	1	1	2
119	1	2	2	1	1	1	2	1	3	2,5	1	1	2	0	2	3	1	1
120	1	1	2	1	3	3	1	3	3	1,6	1	1	2	0	2	2	1	2
121	1	1	2	1	3	3	2	3	3	5	1	2	2	1	..	2	2	2
122	1	1	3	1	1	3	1	2	3	1,6	1	3	3	0	2	1	2	2
123	1	2	3	1	2	3	1	2	2	6	1	2	2	0	2	2	1	..
124	1	1	2	1	5	0	2	2	3	6	1	2	2	0	2	..	1	2
125	1	1	2	2	4	1	2	2	2	1,4	1	2	2	0	2	2	2	2
									Moorea									
126	3	1	3	1	1	2	1	2	3	1,6	1	1	2	0	2	4	1	2
127	2	2	3	2	5	1	2	1	3	3,5	1	1	2	0	2	2	2	2
128	3	1	2	1	..	1	2	2	3	1,6	1	1	2	0	2	2	1	2
129	3	3	2	2	..	1	1	3	3	1,4	1	2	3	0	2	3	1	2
130	2	1	3	1	..	..	..	2	3	2,6	2	2	2	0	2	2	1	2
131	2	2	3	1	1	1	2	2	2	1,4	..	2	2	0	2	3	1	2
132	3	1	3	1	5	0	1	3	3	1,5	1	2	2	0	2	1	2	2
133	2	3	2	2	4	0	1	2	3	1,4	1	2	2	0	2	3	2	..
									Tahiti									
134	1	3	3	1	3	2	1	3	3	2,5	..	..	2	0	2	2	2	2
135	1	1	3	1	2	2	2	2	3	2,4	1	2	2	0	2	2	1	2
136	2	5	3	2	1	1	1	2	3	1,4	1	1	2	0	1	2	1	2
137	1	1	3	1	3	1	..	..	3	1,5	1	2	2	0	2	2	1	2
138	5	3	3	1	5	2	1	2	3	1,4	1	2	2	0	2	2	2	2
139	1	1	3	2	1	3	2	2	2	2,4	1	2	2	0	2	1	2	2
140	1	1	3	1	1	2	2	2	3	1,4	1	1	2	0	2	2	1	2
141	1	1	2	1	1	1	1	2	3	2,4	1	2	2	0	2	2	1	2
142	5	1	3	1	3	1	2	2	3	1,5	1	2	3	0	2	2	2	2
143	2	1	3	1	5	2	..	3	3	2,4	1	1	2	0	2	2	1	2
144	2	1	3	1	2	2	1	3	3	1,4	1	2	2	0	2	1	1	2
145	1	1	3	1	3	1	2	2	2	3,6	1	2	2	0	2	2	2	2
146	1	1	3	1	..	2	1	3	3	1,4	1	1	2	0	2	2	1	2
147	4	1	3	1	1	2	2	2	3	2,6	1	2	2	0	2	1	1	2
148	2	3	3	1	3	2	1	3	3	1,6	1	1	2	0	2	2	1	2
149	1	1	3	1	..	1	1	3	3	1,4	2	1	2	0	2	1	1	2
150	5	1	3	1	..	1	2	2	2	2,4	1	2	2	0	2	1	4	2
151	1	1	3	1	1	1	1	3	3	1,5	1	1	2	0	2	1	1	2
152	1	6	2	1	4	1	1	2	3	1,5	1	2	2	0	2	2	1	2
153	3	1	3	1	3	0	2	2	2	2,4	1	1	2	0	2	1	1	..

6 (175) 9 (186) 10 (103) 11 (201)

135 (204) 138 (191) 143 (195) 145 (197)

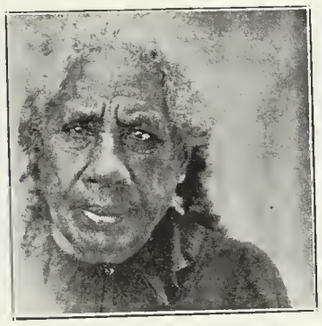
7 (145) 3 (151) 7 (167) 12 (156)

142 (148) 141 (163) 137 (173) 153 (171)

NATIVES OF THE ISLAND OF TAHITI FROM THE FOLLOWING DISTRICTS: PAEA, 6 (175), 9 (186), 10 (203), 11 (201), 135 (204), 138 (191), 143 (195), 145 (197); HAAPAPE, 1 (145), 3 (151), 142 (148); PAPENOO, 7 (167), 12 (156), 137 (173), 141 (163), 153 (171).

(THE NUMBERS REFER TO THE SERIAL NUMBERS IN TABLES 35-40; THOSE IN PARENTHESES ARE THE ORIGINAL PHOTOGRAPH NUMBERS).

56 (133) 53 (125) 59 (142) 54 (130)



132 (189)

132 (190)

128 (121B)

133 (126) 126 (132) 131 (122A)

NATIVES OF THE ISLAND OF MOOREA. (THE NUMBERS REFER TO THE SERIAL NUMBERS IN TABLES 35-40; THOSE IN PARENTHESES ARE THE ORIGINAL PHOTOGRAPH NUMBERS).

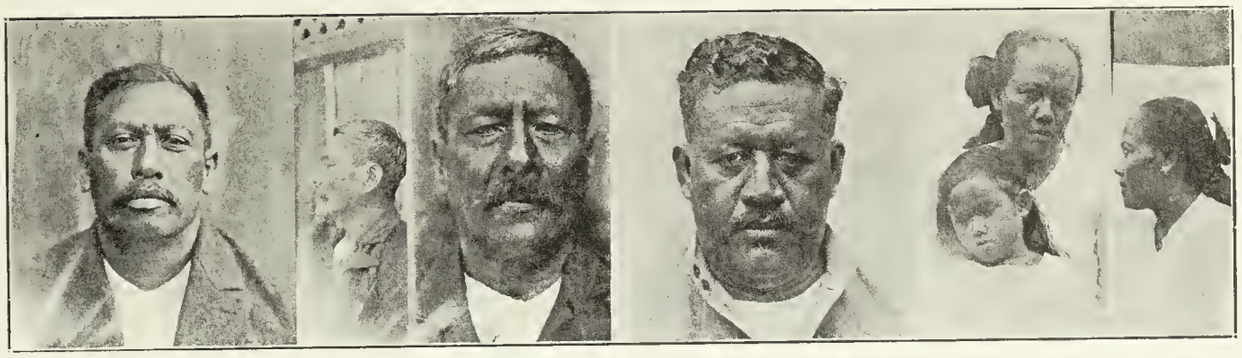
32 (14) 34 (40) 35 (22) 36 (21)

116 (42A) 120 (42B) 117 (9) 31 (9) 47 (94) 103 (94) 105 (105)

48 (110) 49 (102) 51 (80) 106 (87)

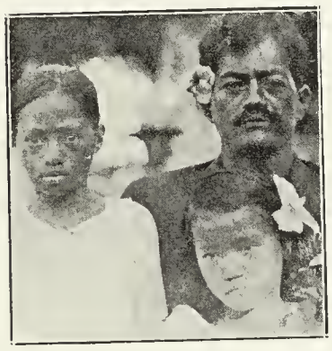
NATIVES OF THE SOCIETY ISLANDS: RAIATEA ISLAND, 32 (14), 34 (40), 35 (22), 36 (21), 116 (42A), 120 (42B), 117 (9), 31 (9); HUAHINE ISLAND, 47 (94), 103 (94), 105 (105), 48 (110), 49 (102, 51 (80), 106 (87).

(NUMBERS REFER TO SERIAL NUMBERS IN TABLES 35-40; NUMBERS IN PARENTHESES ARE ORIGINAL PHOTOGRAPH NUMBERS).



23 (64) 25 (67) 27 (59) 112 (71)

22 (73) 19 (77) 111 (47) 19 (78) 111 (78)



38 (50)

38 (51)

43 (49)

114 (55) 114 (56) 115 (47)

NATIVES OF THE SOCIETY ISLANDS: BORABORA, 23 (64), 25 (67), 27 (59), 112 (71), 22 (73), 19 (77), 111 (47), 19 (78), 111 (78); MAUPITI ISLAND, 38 (50), 38 (51), 43 (49), 114 (55), 114 (56), 115 (47).

(NUMBERS REFER TO SERIAL NUMBERS IN TABLES 35-40; THOSE IN PARENTHESES ARE THE ORIGINAL PHOTOGRAPH NUMBERS).

THE FISHES OF OCEANIA—SUPPLEMENT 1

By Henry W. Fowler

Memoirs of the Bernice P. Bishop Museum
Volume XI, Number 5

(WITH FIGURES 1-7)

HONOLULU, HAWAII
PUBLISHED BY THE MUSEUM
1931

KRAUS REPRINT CO.
Millwood, New York
1974

Reprinted with the permission of the Bishop Museum Press
KRAUS REPRINT CO.
A U.S. Division of Kraus-Thomson Organization Limited

Printed in U.S.A.

THE FISHES OF OCEANIA—SUPPLEMENT 1

By Henry W. Fowler

INTRODUCTION

Since the publication of my "Fishes of Oceania" I have had several opportunities to study additional materials to those reported in that work. A small collection of accessions in Bishop Museum received from various parts of Oceania, I studied in part on my way to the Orient in March-April, 1929, while stopping over in Honolulu a few days. The rest of this material was then sent to Philadelphia so I could incorporate it in the present paper. Notes and collections of Hawaiian fishes were also made in the Honolulu markets, both on my voyage to and from the Orient, also at Suva, Fiji, July 12.

While in Brisbane, during June, 1929, I visited the Queensland Museum several times. Mr. Heber A. Longman, the director, very kindly placed such records and specimens as had been received there from Oceania at my disposal. I am also further indebted to Mr. Tom Marshall of the same institution for assistance with this data.

On his trip around the world Mr. R. W. Wehrle, of Indiana, Pennsylvania, obtained a collection of market fishes in Honolulu and sent them to Philadelphia. As these were in an exceptionally fine state of preservation when received, many notes, especially relative to coloration in a fresh state, were made and included in the present paper.

I have fortunately been able to consult the other catalogs of the Museum Godeffroy, numbers 1, 2, 3, 7 and 8 by Schmeltz and numbers 9 and 10 by Pöhl, through the kindness of Dr. Walther Horn of Berlin-Daalem, Germany. Dr. Horn very kindly arranged to have photostat copies made of all the pages referring to ichthyology sent to me. The references pertaining to Oceania and many important additional items in distribution are all included in the present paper. Mr. Gilbert P. Whitley has sent me some of his papers, especially his list from the Santa Cruz Islands, besides an important list of corrections and annotations to my "Fishes of Oceania."

I wish here to acknowledge indebtedness to the Academy of Natural Sciences of Philadelphia for the loan of a number of the blocks used for the cuts in my "Fishes of Oceania."

I include the neglected short paper by Hialmar Rendahl in which 15 species are listed, of which 3 are described as new,[1] though only 1 is accepted in the present work.

The following are the new taxonomic items:

Drombus whitleyi new name—Gobiidae.
Rhinogobius laddi new species—Gobiidae.
Ostracion whitleyi new name—Ostraciontidae.

The following are new additions to my "Fishes of Oceania," indicated in the text by an asterisk:

Scoliodon dumerilii (Bleeker).
Urogymnus asperrimus (Schneider).
Dasyatis granulatus (Macleay).
Chirocentrus dorab (Forskål).
Conger orbignyanus Valenciennes.
Muraenichthys macropterus Bleeker.
Ophichthus bonaparti (Kaup).
Achirophichthys typus Bleeker.
Lycodontis makassariensis (Bleeker).
Myctophum hians Richardson.
Lionurus microlepis (Günther).
Hymenocephalus longibarbus (Günther).
Pseudorhombus multimaculatus (Günther).
Holocentrus angustifrons Ogilby.
Stigmatophora nigra Kaup.
Syngnathus margaritifer Peters.
Syngnathus semistriatus (Kaup).
Hippocampus foliatus Perry.
Mugil peronii Valenciennes.
Sphyraena novae-hollandiae (Günther).
Caranx djeddaba (Forskål).
Carangichthys typus Bleeker.
Rachycentron canadum (Linné).
Amia gjellerupi (Weber and Beaufort).
Amia heurni (Weber and Beaufort).
Amia endekataenia (Bleeker).
Amia quadrifasciata Cuvier.
Amia exostigma Jordan and Seale.
Amia dammermani Weber and Beaufort.
Amia melas (Bleeker).
Ambassis agrammus Günther.
Ambassis buton Popta.
Ambassis reticulata Weber.
Serranus malabaricus (Schneider).
Plesiops melas Bleeker.
Lutjanus ehrenbergii (Peters).
Caesio cylindricus Günther.
Pelates quadrilineatus (Bloch).
Pentapodus xanthopleura (Bleeker).
Dentex furcosus Valenciennes.
Dentex gracilis Bleeker.
Upeneus trifasciatus (Lacépède).
Upeneus chrysonemus (Jordan and Evermann).
Gobius frenatus Günther.
Petroscirtes anema Bleeker.
Salarias hasseltii Bleeker.
Salarias striatomaculatus Kner and Steindachner.
Aspasmogaster oro (Steindachner).
Antennarius nigramaculatus Playfair.

[1] Carl Skottsberg, The Nat. Hist. of Juan Fernandez and Easter Island, "The Fishes of Easter Island," vol. 3, zool. pt. I, art. 11, pp. 59-68, 1921.

DESCRIPTION OF SPECIES

ORECTOLOBIDAE

Hemiscyllium ocellatum (Bonnaterre).

Chiloscyllium ocellatum Ogilby: Cat. Fishes Australian Museum, pt. 1, p. 8, 1888 (southeast New Guinea and Port Moresby).

The specimen in the U. S. National Museum labeled Port Jackson is doubtless with erroneous locality, according to Mr. Whitley, though the species is very common in Queensland.

Ginglymostoma ferrugineum (Lesson).

Ginglymostoma concolor (non Rüppell) Ogilby: Cat. Fishes Australian Museum, pt. 1, p. 7, 1888 (Purves Sound, Solomons).

GALEORHINIDAE (=EULAMIIDAE)

Galeocerdo arcticus (Faber).

Galeocerdo tigrinus Ogilby: Cat. Fishes Australian Museum, pt. 1, p. 3, 1888 (Ugi, Solomon Islands).

Eulamia melanopterus (Quoy and Gaimard).

Carcharias (Prionodon) melanapterus Schmeltz: Mus. Godeffroy, Cat. 7, p. 64, 1879 (Viti Islands).

Carcharias melanopterus Ogilby: Cat. Fishes Australian Museum, pt. 1, p. 2, 1888 (Ugi, Solomon Islands).

Carcharhinus melanopterus Whitley: Pan-Pacific Inst., Jour., vol. 2, no. 1, p. 3, January-March, 1927 (Fiji).

Eulamia menisorrah (Müller and Henle).

Carcharias menisorrah Ogilby: Cat. Fishes Australian Museum, pt. 1, p. 2, 1888 (Port Moresby).

Scoliodon dumerilii (Bleeker).*

Carcharias (Scoliodon) dumerilii Bleeker: Soc. Sci. Ind. Neerl., Act., vol. mo. 5, 1, p. 70, 1856 (type loc. Amboina).

Carcharias dumerilii Ogilby: Cat. Fishes Australian Museum, pt. 1, p. 1, 1888 (New Hebrides).

Scoliodon palasorrah (Cuvier).*

Carcharias acutus Schmeltz: Mus. Godeffroy, Cat. 2, p. 10, 1865 (South Seas).

SPHYRNIDAE

Sphyrna zygaena (Linné).

Zygaena malleus Schmeltz: Mus. Godeffroy, Cat. 7, p. 64, 1879 (Tonga Islands).

SQUALIDAE

Squalus suckleyi (Girard).

Acanthias vulgaris (non Risso) Müller and Henle: Beschr. Plagiostomen, p. 83, 1841 ("Südsee").

ECHINORHINIDAE

Isistius brasiliensis (Quoy and Gaimard).

Isistius brasiliensis Whitley: Pan-Pacific Inst., Jour., vol. 2, no. 1, p. 3, 1927 (Fiji).

Isistius ferox Schmeltz: Mus. Godeffroy, Cat. 2, p. 10, 1865 (South Seas).

Leius ferox Schmeltz: op. cit., 3, p. 13, 1866 (South Seas).

RHINOBATIDAE [2]

Rhinobatos granulatus Cuvier.

Rhinobatus granulatus Ogilby: Cat. Fishes Australian Museum, pt. 1, p. 14, 1888 (Southeast New Guinea).

[2] *Raja nasuta* (Banks) Müller and Henle, Beschr. Plagiostomen, p. 150, 1841 (type loc., "Südsee") really pertains to Australia and New Zealand.

DASYATIDAE

Urogymnus asperrimus (Schneider).*

Raja asperrima Schneider: Syst. Ichth. Bloch, p. 367, 1801 (type loc., Bombay, India).

Urogymnus asperrimus Ogilby: Cat. Fishes Australian Museum, pt. 1, p. 18, 1888 (Kingsmill Islands).

Dasyatis sephen (Forskål).

Trygon sephen Ogilby: op. cit., pt. 1, p. 20, 1888 (southeast New Guinea).

Mr. Whitley writes the type of *Taeniura atra* Macleay, in the Australian Museum, is a synonym of the present species.

Dasyatis kuhlii (Müller and Henle).

Trygon kuhlii Ogilby: Cat. Fishes Australian Museum, pt. 1, p. 19, 1888 (Tonga; Ugi, Solomons; southeast New Guinea).

Dasyatis kuhlii Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 11, 1928 (Santa Cruz Islands).

Dasyatis brevis (Garman).

One seen in the Honolulu markets, March 30, and another April 1, 1929.

Dasyatis granulatus (Macleay).*

Trygon granulata Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 598, 1883 (type loc., New Guinea).

Himantura granulata Whitley: Pan-Pacific Inst. Jour., vol. 3, no 1, p. 11, January-March, 1928 (Santa Cruz Islands).

Taeniura lymma (Forskål).

Taeniura lymma Schmeltz: Mus. Godeffroy, Cat. 7, p. 64, 1879 (Kandavu).—Ogilby: Cat. Fishes Australian Museum, pt. 1, p. 20, 1888 (southeast New Guinea).

MYLIOBATIDAE

Aetobatus narinari (Euphrasen).

Aëtobatis narinari Schmeltz: Mus. Godeffroy, Cat. 7, p. 64, 1879 (South Seas).

Stoasodon narinari Jordan: Pan-Pacific Inst., Jour., vol. 2, no. 4, p. 3, October-December, 1927 (Samoa).

MOBULIDAE

Manta birostris (Walbaum).

Ceratoptera Ogilby: Cat. Fishes Australian Museum, pt. 1, p. 23, 1888 (New Hebrides).

ELOPIDAE

Elops hawaiensis Regan.

Elops hawaiensis Whitley: Pan-Pacific Inst., Jour., vol. 2, no. 1, p. 3, March, 1927 (Fiji).—Jordan: Pan-Pacific Inst., Jour., vol. 2, no. 4, p. 3, October-December, 1927 (Samoa).

Common in Honolulu markets, March 30 and 31, April 1 and 2, also July 19, 1929. On March 30, at least 50, some 900 mm. long.

Megalops cyprinoides (Broussonet).

Megalops cyprinoides Schmeltz: Mus. Godeffroy, Cat. 7, p. 58, 1879 (Viti and Samoa Islands).—Pöhl: op. cit., 9, p. 39, 1884 (Samoa).

ALBULIDAE

Albula vulpes (Linné).

Albula conorhynchus Schmeltz: Mus. Godeffroy, Cat. 7, p. 58, 1879 (Samoa).

Back drab-gray, sides and below whitish. Along each row of scales at intersections a smoke-gray streak or band, wide as intervening pale band, all above lateral line darker but below pale and appearing as if seen through general coloration. Whole body with brilliant silvery-white reflections. Head olive-buff above, below bright silvery-white and broad adipose region of eye cream-buff. Iris shining silvery-white. Snout tip dusky. Fins all more or less cream-buff. Dorsal and caudal neutral-grayish terminally and paired fins nearly naples-yellow basally. Lower fins all with bright silvery-white reflections on scaly areas. Length 245 mm. Honolulu. R. W. Wehrle.

Abundant in the Honolulu markets, March 30 and 31, April 1 and 2, July 19, 1929.

CHANIDAE

Chanos chanos (Forskål).

Chanos chanos Whitley: Pan-Pacific Inst., Jour., vol. 2, no. 1, p. 3, January-March, 1927 (Fiji).

Chanos orientalis Schmeltz: Mus. Godeffroy, Cat. 1, p. 10, 1864 (South Seas).

Chanos salmonéus Schmeltz: op. cit., 7, p. 59, 1879 (South Seas).—Pöhl: op. cit., 9, p. 39, 1884 (South Seas).

Common in the Honolulu market, all ages, March 30, April 1 and 2, July 19, 1929.

CHIROCENTRIDAE

Chirocentrus dorab (Forskål).*

Neosudis vorax Castelnau: Zool. Acclimat. Soc. Victoria, Proc., vol. 2, p. 118, 1873 (type loc., Noumea, New Caledonia).—Fowler: B. P. Bishop Mus., Mem. 10, p. 66, 1928 (compiled).

I have placed the above references with this species from Whitley (Linn. Soc. New South Wales, Proc., abstract September 25, 1929), though he admits the Pacific Wolf Herring as *Chirocentrus dorab vorax* (Castelnau).

CLUPEIDAE [3]

Stolephorus delicatulus (Bennett).

Spratelloides delicatulus Schmeltz: Mus. Godeffroy, Cat. 7, p. 58, 1879 (Samoa).—Pöhl: Mus. Godeffroy, Cat. 9, p. 39, 1884 (Samoa).

Stolephorus alburnus (Kner).

Spratelloides alburnus Schmeltz: Mus. Godeffroy, Cat. 7, p. 58, 1879 (Samoa).—Pöhl: op. cit., 9, p. 39, 1884 (Samoa).

Stolephorus japonicus (Houttuyn).

Spratelloides gracilis Schmeltz: Mus. Godeffroy, Cat. 7, p. 58, 1879 (Viti Levu).—Pöhl: op. cit., 9, p. 39, 1884 (Viti Levu).

Sardinella perforata (Cantor).

Clupea zunasi Schmeltz: Mus. Godeffroy, Cat. 7, p. 58, 1879 (Savaii).

Clupea zeunasi Pöhl: op. cit., 9, p. 39, 1884 (Savaii).

[3] *Ethmidium maculatum* (Valenciennes) is known only from the Pacific Coast of South America. It was later described as *Clupea notacanthus* Günther, Cat. Fishes Brit. Mus., vol. 7, p. 443, 1868 (type locality, Valparaiso).—Schmeltz: Mus. Godeffroy, Cat. 7, p. 58, 1879 (South Seas). The indefinite record by Schmeltz does not establish the species in Oceania.

Sardinella jussieu (Lacépède).

Spratella fimbriata Schmeltz: Mus. Godeffroy, Cat. 2, p. 9, 1865 (Samoa).

Clupea fimbriata Schmeltz: op. cit., 7, p. 58, 1879 (Upolu).

Clupea tembang Schmeltz: op. cit., 7, p. 58, 1879 (Tonga Islands).—Pöhl: op. cit., 9, p. 39, 1884 (Tonga).

Sardinella melanura (Cuvier).

Clupeonia commersonii Schmeltz: Mus. Godeffroy, Cat. 2, p. 9, 1865 (Samoa).

Clupea atricauda Schmeltz: op. cit., 7, p. 58, 1879 (Upolu).—Pöhl: op. cit., 9, p. 39, 1884 (Upolu).

Harengula punctata (Rüppell).

Clupea punctata Schmeltz: Mus. Godeffroy, Cat. 7, p. 58, 1879 (South Seas).

Clupea venenosa Schmeltz: op. cit., 8, p. 7, 1881 (Ponape).—Pöhl: op. cit., 9, p. 39, 1884 (Ponape).

Harengula vittata (Valenciennes).

Harengula vittata Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 11, January-March, 1928 (Santa Cruz Islands).

Clupeoides papuensis (Ramsay and Ogilby).

Six in the Queensland Museum from Strickland River, New Guinea, largest 75 mm.

ENGRAULIDAE

Engraulis baelama (Forskål).

Engraulis encrasicholoides Schmeltz: Mus. Godeffroy, Cat. 7, p. 58, 1879 (Savaii).—Pöhl: op. cit., 9, p. 39, 1884 (Savaii).

SYNBRANCHIDAE

Synbranchus bengalensis (McClelland).

Symbranchus bengalensis Schmeltz: Mus. Godeffroy, Cat. 7, p. 59, 1879 (Pelew [Palau] Islands).—Pöhl: op. cit., 9, p. 39, 1884 (Pelew [Palau] Islands).

MURAENIDAE

Muraena mauritiana (Bennett).

Anguilla mauritiana (J. Schmidt) Whitley; Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 11, January-March, 1929 (Santa Cruz Islands).

Anguilla bengalensis Schmeltz: Mus. Godeffroy, Cat. 7, p. 59, 1879 (Upolu).—Pöhl: op. cit., 9, p. 40, 1884 (Upolu).

Anguilla fidjiensis Schmeltz: op. cit., 7, p. 59, 1879 (Viti and Tonga Islands).

Anguilla labiata Schmeltz: op. cit., 8, p. 7, 1881 (Ponape).—Pöhl: op. cit., 9, p. 40, 1884 (Ponape).

Muraena celebesensis (Kaup).

Anguilla marmorata Schmeltz: Mus. Godeffroy, Cat. 1, p. 10, 1864 (South Seas).—Schmeltz: op. cit., 3, p. 11, 1866 (Samoa).

Anguilla obscura Schmeltz: op cit., 7, p. 59, 1879 (Viti Island).

Muraena australis (Richardson).

Anguilla australis Schmeltz: Mus. Godeffroy, Cat. 7, p. 59, 1879 (Vitu Levu).

Anguilla bicolor Schmeltz: op. cit., 7, p. 59, 1879 (Upolu).

Anguilla virescens Schmeltz: op. cit., 7, p. 59, 1879 (Savaii).—Pöhl: op. cit., 9, p. 40, 1884 (Savaii).

Anguilla sidat Schmeltz: op. cit., 7, p. 59, 1879 (Upolu).

Muraena halmaherensis Schmeltz: op. cit., 7, p. 60, 1879 (Kanathia).

CONGRIDAE

Conger cinereus Rüppell.

Conger marginatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 59, 1879 (Kandavu).—Pöhl: op. cit., 9, p. 40, 1884 (Kandavu).

Leptocephalus bimaculatus Schmeltz: op. cit., 7, p. 61, 1879 (South Seas).—Pöhl: op. cit., 9, p. 40, 1884 (South Seas).

Conger orbignyanus Valenciennes.*

Conger orbignyanus Valenciennes: Voyage Amer. Merid. D'Orbigny, vol. 5, p. 10, pl. 12, fig. 1, 1847 (type loc., South America).

Conger multidens Pöhl: Mus. Godeffroy, Cat. 9, p. 40, 1884 (Viti Levu).—Whitley: Pan-Pacific Inst., Jour., vol. 2, no. 1, p. 4, January-March, 1927 (on Pöhl).

Endeconger platyrhynchus (Norman).

Mr. Whitley calls my attention to *Brachyconger* Norman as preoccupied and that *Endeconger* Jordan 1923 replaces it.

Leptocephalus taenia Lesson.

Leptocephalus taenia Schmeltz: Mus. Godeffroy, Cat. 7, p. 60, 1879 (South Seas).—Pöhl: op. cit., 9, p. 40, 1884 (South Seas).

Leptocephalus multimaculatus Steindachner.

Leptocephalus multimaculatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 61, 1879 (South Seas).

Veternio verrens Snyder.

Live adult example seen in the Waikiki Aquarium, March 29.

ECHELIDAE

Muraenichthys macropterus Bleeker.*

Muraenichthys labialis Seale: Mus. Comp. Zool., Bull., vol. 61, no. 4, p. 80, May, 1917 (type loc., Arhno Atoll, Marshall Islands).

OPHICHTHYIDAE

Myrichthys colubrinus (Boddaert).

Leiuranus colubrinus Schmeltz: Mus. Godeffroy, Cat. 3, p. 12, 1866 (Samoa).

Ophichthys colubrinus Schmeltz: op. cit., 7, p. 59, 1879 (Viti Islands).

Ophisurus alternaus Schmeltz: op. cit., 1, p. 10, 1864 (South Seas). (Misprint.)

Ophisurus alternans Schmeltz: op. cit., 9, p. 40, 1884 (Viti).

Ophisurus fasciatus Schmeltz: op. cit., 3, p. 11, 1866 (Samoa).

In the Queensland Museum I noted the following: two from Papua in old collection; type of *Ophichthys naja* De Vis from south sea islands, Captain C. F. Browne: two from Mortlock Island by Mrs. C. A. MacFarlane, 525 and 675 mm. long.

Myrichthys maculosus (Cuvier).

Ophichthys maculosus Schmeltz: Mus. Godeffroy, Cat. 7, p. 59, 1879 (Tahiti).

Callechelys filaria (Günther).

Ophichthys filaria Schmeltz: Mus. Godeffroy, Cat. 8, p. 8, 1881 (Viti).

Bascanichthys pusillus Seale: Mus. Comp. Zool., Bull., vol. 61, no. 4, p. 81, 1917 (type loc., Fiji).—Whitley: Pan-Pacific Inst., Jour., vol. 2, no. 1, p. 4, January-March, 1927 (Fiji).

Leiuranus semicinctus (Lay and Bennett).

Leiuranus semicinctus Schmeltz: Mus. Godeffroy, Cat. 7, p. 59, 1879 (South Seas).—Pöhl: op. cit., 9, p. 40, 1884 (South Seas).—Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 11, January-March, 1928 (Santa Cruz Islands).

Pisoodonophis cancrivorus (Richardson).

Ophichthys cancrivorus Schmeltz: Mus. Godeffroy, Cat. 7, p. 59, 1879 (Viti Levu).

Ophichthus cephalozona Bleeker.

Ophichthys cephalozona Schmeltz: Mus. Godeffroy, Cat. 7, p. 59, 1879 (South Seas).—Pöhl: op. cit., 9, p. 40, 1884 (South Seas).

Ophichthus bonaparti (Kaup).*

Poecilocephalus bonaparti Kaup: Cat. Apodal Fish. Brit. Mus., p. 5, fig. 3, 1856 (type loc., Amboyna).

Ophichthys bonapartii Schmeltz: Mus. Godeffroy, Cat. 7, p. 59, 1879 (Raiatea).—Pöhl: op. cit., 9, p. 40, 1884 (Raiatea).

Brachysomophis crocodilinus (Bennett).

Ophichthys crocodilinus Schmeltz: Mus. Godeffroy, Cat. 7, p. 59, 1879 (Savaii and Tahiti).

Caecula longipinne (Kner and Steindachner).

Sphagebranchus longipinnis Schmeltz: Mus. Godeffroy, Cat. 3, p. 12, 1866 (Samoa).

Caecula bicolor (Kaup).

Ophichthys bicolor Schmeltz: Mus. Godeffroy, Cat. 7, p. 59, 1879 (Viti Islands).

Caecula flavicauda (Snyder).

In Bishop Museum one 402 mm. long from Pearl and Hermes Reef, April, 1927, T. T. Dranga.

Achirophichthys typus Bleeker.*

Achirophichthys typus Bleeker: Nederl. Tijdschr. Dierk., vol. 2, p. 42, 1862 (type loc., Celebes).—Pöhl: Mus. Godeffroy, Cat. 9, p. 40, 1884 (Viti).

MORINGUIDAE

Aphthalmichthys microchir (Bleeker).

Moringua lumbricoidea Schmeltz: Mus. Godeffroy, Cat. 7, p. 59, 1879 (Ovalau).

Aphthalmichthys abbreviatus Bleeker.

Moringua abbreviata Schmeltz: Mus. Godeffroy, Cat. 7, p. 59, 1879 (Viti Levu).

Aphthalmichthys javanicus Kaup.

Moringua javanica Schmeltz: Mus. Godeffroy, Cat. 7, p. 59, 1879 (Samoa Islands).

ECHIDNIDAE

Echidna zebra (Shaw).

Echidna zebra Schmeltz: Mus. Godeffroy, Cat. 3, p. 12, 1866 (Samoa).—Pöhl: op. cit., 9, p. 40, 1884 (Samoa).

Muraena zebra Schmeltz: op. cit., 7, p. 60, 1879 (Samoa and Viti Islands).

Echidna polyzona (Richardson).

Poecilophus polyzonus Schmeltz: Mus. Godeffroy, Cat. 2, p. 9, 1865 (Samoa).

Muraena polyzona Schmeltz: op. cit., 3, p. 12, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 60, 1879 (Samoa).—Pöhl: op. cit., 9, p. 39, 1884 (Samoa).

Echidna polyzona Schmeltz: op. cit., 3, p. 11, 1866 (Samoa).

Whitish generally, with 25 transverse broad sepia-black bands of which in pale spaces of last three on trunk are dark triangular blotches. Large external isopod crustacean parasite on thorax. Length 147 mm. Honolulu. R. W. Wehrle.

Echidna nebulosa (Ahl).

Muraena nebulosa Schmeltz: Mus. Godeffroy, Cat. 7, p. 60, 1879 (South Seas).—Pöhl: op. cit., 9, p. 39, 1884 (South Seas).

Echidna nebulosa Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 11, January-March, 1928 (Santa Cruz Islands).

In Bishop Museum one 324 mm. obtained by Dr. Ladd at Suva Point, Fiji, January 28, 1926. Also one 258 mm. from Guam by Lieut. H. G. Hornbostel in 1926.

Echidna amblyodon (Bleeker).

Muraena amblyodon Schmeltz: Mus. Godeffroy, Cat. 7, p. 60, 1879 (Savaii).

Rhinomuraena quaesita Garman.

Rhinechidna eritomia Jordan: Pan-Pacific Inst., Jour., vol. 2, no. 4, p. 4, October-December, 1927 (Samoa: evidently lapsus for *Nettastomops barbatula* Steindachner in compilation).

Strophidon brummeri (Bleeker).

Muraena brummeri Schmeltz: Mus. Godeffroy, Cat. 7, p. 60, 1879 (Raiatea).—Pöhl: op. cit., 9, p. 40, 1884 (Raiatea).

Lycodontis picta (Ahl).

Muraena picta Schmeltz: Mus. Godeffroy, Cat. 7, p. 60, 1879 (Samoa).—Pöhl: op. cit., 9, p. 39, 1884 (Samoa).

Gymnothorax pictus Pöhl: op. cit., 9, p. 40, 1884 (South Seas).—Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 11, January-March, 1928 (Santa Cruz Islands).

Muraena variegata Schmeltz: op. cit., 1, p. 10, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 9, 1865 (Uea, Wallis Island: South Seas).

Echidna variegata Schmeltz: op. cit., 3, p. 11, 1866 (Samoa).

Muraena picta var. *albicans* Schmeltz: op. cit., 7, p. 60, 1879 (Samoa).

One in Bishop Museum 196 mm. obtained by Dr. Ladd at Suva Point, Fiji, January 9, 1926.

Lycodontis thyrsoidea (Richardson).

Muraena thyrsoidea Pöhl: Mus. Godeffroy, Cat. 9, p. 39, 1884 (Samoa).

Thyrsoidea arenata Schmeltz: op. cit., 2, p. 9, 1865 (Samoa).—Schmeltz: op. cit., 3, p. 11, 1866 (Samoa).

Gymnothorax obscurirostris Rendahl: Nat. Hist. Juan Fernandez and Easter Island, Skottsberg, vol. 3, Zool. pt. 1, p. 62, 1921 (type loc., Easter Island).

Depth 1 4/5 in head; head 9 3/5 in total length, 4 2/5 to vent. Snout 6 2/5 in head; eye 9 3/5, 1 1/2 in snout, 1 2/5 in interorbital; mouth cleft 2 7/10; upper teeth 12 (14?), uniserial anteriorly, laterally on each side with about 5 small teeth forming an outer series close to inner one; in mesial upper line 3 large depressible fangs, with 5 very blunt short teeth on vomer; maxillary teeth biserial, outer row of 10 triangular rather compressed moderate teeth, inner of 5 tall slender teeth; mandible with front teeth biserial, about 6 in each row and laterally single row of 9 compressed triangular teeth; front nasal tentacles short; gill opening somewhat wider than eye. No scale pouches. Yellow, marbled with yellowish-brown and marked with irregular and partly confluent dark-brown spots. Snout and interorbital uniform dusky. Length 260 mm. (Rendahl).

Rendahl says "This species evidently is very nearly allied to *G. thyrsoidea* Rich., from which it may be recognized by its different dentition (biserial ethmo-vomerine teeth laterally, comparatively fewer teeth, etc.) and perhaps also by a more restricted entant [extent] of the dark part of the forehead. In a specimen of *G. thyrsoidea* before me the postocular part of the dark area in question is more than two times the length of the snout, whereas in the type specimen of *G. obscurirostris* it is restricted to the snout and the interorbital region." To me it appears to fall within the limits of the variation of *Lycodontis thyrsoidea*.

Lycodontis meleagris (Shaw and Nodder)

Muraena meleagris Schmeltz: Mus. Godeffroy, Cat. 7, p. 59, 1879 (Tonga Islands).

In the Bishop Museum three examples 170 to 240 mm. from Waikiki Reef in 1925 by W. E. Hoffman.

Five examples 78 to 185 mm. Honolulu. R. W. Wehrle. The two larger very like my nominal *Lycodontis parvibranchialis*, whereas the three smaller ones are much darker, nearly slate-black generally, though with markings like the others. The two smaller ones are nearly slate or dusky-black with four to six rows longitudinally of dull yellowish spots.

Lycodontis polyuranodon (Bleeker).

Muraena polyuranodon Schmeltz: Mus. Godeffroy, Cat. 7, p. 60, 1879 (Viti Islands).

Lycodontis petelli (Bleeker).

Muraena petelli Schmeltz: Mus. Godeffroy, Cat. 7, p. 59, 1879 (Samoa).

Gymnothorax petelli Pöhl: op. cit., 9, p. 40, 1884 (South Seas).

Lycodontis ruppelli (McClelland).

Gymnothorax reticulatus Schmeltz: Mus. Godeffroy, Cat. 3, p. 12, 1866 (Samoa).

Muraena reticularis (non Bloch) Schmeltz: op. cit., 7, p. 60, 1879 (Kandavu).—Pöhl: op. cit., 9, p. 40, 1884 (Kandavu).

Lycodontis flavomarginata (Rüppell).

Muraena flavomarginata Schmeltz: Mus. Godeffroy, Cat. 7, p. 60, 1879 (Savaii).—Pöhl: op. cit., 9, p. 40, 1884 (Savaii).

Found the following in the Honolulu markets: two March 29, one March 30, six March 31, four July 19.

Lycodontis undulata (Lacépède).

Muraena undulata Schmeltz: Mus. Godeffroy, Cat. 7, p. 60, 1879 (Samoa and Viti Levu).—Pöhl: op. cit., 9, p. 39, 1884 (Viti and Samoa).

Thyrsoidea canceliata Schmeltz: op. cit., 2, p. 9, 1865 (Samoa).—Schmeltz: op. cit., 3, p. 12, 1866 (Samoa).

Muraena fimbriata Schmeltz: op. cit., 7, p. 60, 1879 (South Seas).—Pöhl: op. cit., 9, p. 39, 1884 (South Seas).

Muraena microspila Schmeltz: op. cit., 7, p. 60, 1879 (Savaii).

Gymnothorax isingleena Pöhl: op. cit., 9, p. 40, 1884 (South Seas).

Gymnothorax zonipectus Whitley; Pan-Pacific Inst., Jour., vol. 1, no. 2, p. 8, January-March, 1927 (Rotuma).

Found the following in the Honolulu markets: two March 29, two March 30, two March 31, one April 1, three April 2, four July 19. Two in the Bishop Museum, 204 to 215 mm., obtained at Honolulu. Also one 134 mm. long from Suva, Fiji, June 10, 1926, Dr. H. L. Ladd. Found under old coral blocks, old reef flat near Fiji Museum. This is the *fimbriata* form.

Lycodontis favaginea (Schneider).

Gymnothorax favagineus Schmeltz: Mus. Godeffroy, Cat. 1, p. 10, 1864 (South Seas).—Schmeltz: op. cit., 3, p. 12, 1866 (Samoa).—Whitley: Pan-Pacific Inst., Jour., vol. 2, no. 1, p. 4, January-March, 1927 (Fiji).

Muraena tessellata Schmeltz: op. cit., 7, p. 60, 1879 (South Seas).—Pöhl: op. cit., 9, p. 39, 1884 (South Seas).

In the Queensland Museum large example from the Hervey Islands.

Lycodontis reevesii (Richardson).

Thyrsoidea reevesii Schmeltz: Mus. Godeffroy, Cat. 2, p. 9, 1865 (Samoa).

Muraena reevesi Schmeltz: op. cit., 7, p. 60, 1879 (Samoa).

Lycodontis nubila (Richardson)

Muraena nubila Schmeltz: Mus. Godeffroy, Cat. 7, p. 60, 1879 (Raratonga).—Pöhl: op. cit., 9, p. 40, 1884 (Rarotonga).

Lycodontis richardsonii (Bleeker).

Muraena richardsoni Schmeltz: Mus. Godeffroy, Cat. 7, p. 60, 1879 (Tonga Islands, Rarotonga).—Pöhl: op. cit., 9, p. 40, 1884 (Tonga).

Lycodontis hepatica (Rüppell).

Muraena hepatica Schmeltz: Mus. Godeffroy, Cat. 7, p. 60, 1879 (Savaii).

Gymnothorax hepatica Pöhl: op. cit., 9, p. 40, 1884 (South Seas).

Lycodontis makassariensis (Bleeker).*

Gymnothorax makassariensis Bleeker: Nederl. Tijdschr. Dierk., vol. 1, p. 163, 1868 (type loc., Celebes [Macassar]).

Muraena macassariensis Schmeltz: Mus. Godeffroy, Cat. 7, p. 60, 1879 (Tahiti).—Pöhl: op. cit., 9, p. 40, 1884 (Tahiti).

Muraena thyrsoidea (part) Richardson: Voyage Sulphur, Ichth., pl. 49, fig. 1, 1844.

Enchelynassa canina (Quoy and Gaimard).

Enchelynassa rhinechidna Jordan: Pan-Pacific Inst., Jour., vol. 2, no. 4, p. 4, October-December, 1927 (Samoa; evidently lapsus in compilation).

Uropterygius tigrinus (Lesson).

Ichthyophis tigrinus Schmeltz: Mus. Godeffroy, Cat. 2, p. 9, 1865 (Samoa).

Gymnomuraena tigrina Schmeltz: op. cit., 7, p. 60, 1879 (South Seas).—Pöhl: op. cit., 9, p. 40, 1884 (South Seas).

Gymnothorax xanthopleura Pöhl: op. cit., 9, p. 40, 1884 (South Seas).

Uropterygius concolor Rüppell.

Uropterygius concolor Whitley: Pan-Pacific Inst., Jour., vol. 1, no. 2, p. 8, January-March, 1927 (Rotuma).

Scuticaria unicolor Seale: Mus. Comp. Zool., Bull., vol. 61, no. 4, p. 94, May, 1917 (type loc., Society Islands).

Uropterygius marmoratus (Lacépède).

Gymnomuraena marmorata Schmeltz: Mus. Godeffroy, Cat. 7, p. 60, 1879 (Uea and Savaii).—Pöhl: op. cit., 9, p. 40, 1884 (South Seas).

COBITIDAE

Misgurnus anguillicaudatus (Cantor).

One example of this introduced species, 120 mm. long, found in a fresh-water drain along a street of Honolulu, March, 1927, by Mr. Yoshito Kenjo.

TACHYSURIDAE

Tachysurus armiger (De Vis).

Type and paratype of *Arius armiger* De Vis, 187 mm. long, from New Britain, in the Queensland Museum. No. 3088-9.

Netuma thalassina (Rüppell).

Arius thalassinus Schmeltz: Mus. Godeffroy, Cat. 7, p. 56, 1879 (Tonga Islands).

Nedystoma dayi (Ramsay and Ogilby).

Type and four paratypes of *Hemipimelodus dayi* Ramsay and Ogilby from the Strickland River, Papua, in the Queensland Museum. No. 879.

Hemipimelodus crassilabris Ramsay and Ogilby.

Type 162 mm. long, from the Strickland River, Papua, in the Queensland Museum. No. 857.

PLOTOSIDAE

Plotosus canius Buchanan-Hamilton.

Plotosus canius Schmeltz: Mus. Godeffroy, Cat. 7, p. 56, 1879 (Viti Islands).

Plotosus anguillaris (Bloch).

Plotosus anguillaris Schmeltz: Mus. Godeffroy, Cat. 1, p. 10, 1864 (South Seas).—Schmeltz: op. cit., 7, p. 56, 1879 (Kandavu and Pelew [Palau] Islands).—Pöhl: op. cit., 9, p. 38, 1884 (Pelew Islands).

CLARIIDAE

Clarias magur Buchanan-Hamilton.

Doubtless introduced if at all present in the "South Sea," as listed by Pöhl (Mus. Godeffroy, Cat. 9, p. 38, 1884).

SYNODONTIDAE

Synodus japonicus (Houttuyn).

Saurus varius Schmeltz: Mus. Godeffroy, Cat. 7, p. 57, 1879 (Samoa, Viti, Society Islands).—Pöhl: op. cit., 9, p. 38, 1884 (Samoa).

Generally neural rose-purple to burnt-carmine above, mottled with brown. Six broad sepia-to-olive saddles on back, each interspace with narrower paler one: on sides of body large dark saddles become drab to ochraceous-rufous, joined by a median lateral streak: each extended downward as dark bar into white of under surface, besides still further intermediate streaks, though

these latter all paler. Iris rosy, also sides of head and mandible, which has three dark-olive transverse blotches with smaller intervening rosy spots. Dorsal transparent, each ray pinkish-buff with four to six ochraceous or darker blotches. Caudal transparent, each lobe with six broad orange ochraceous-buff transverse blotches. Pectoral pale-rose, with deep-rose basally and washed with some orange-ochraceous blotches, also few transverse white lines and dots. Anal white, with two buff blotches. Ventral white, with six broad transverse buff blotches. Two, 160 to 167 mm. Honolulu. R. W. Wehrle.

Two in the Honolulu markets, March 30, common July 19.

Saurida gracilis (Quoy and Gaimard).

Saurida nebulosa Schmeltz: Mus. Godeffroy, Cat. 7, p. 57, 1879 (Uea, Rarotonga).—Pöhl: op. cit., 9, p. 38, 1884 (Rarotonga).

Saurida tumbil (Bloch).

Saurida tumbil Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 11, January-March, 1928 (Santa Cruz Islands).

MYCTOPHIDAE

Myctophum hians Richardson.*

Myctophum hians Richardson: Voyage "Erebus" and "Terror," Ichth., p. 41, pl. 27, figs. 19-20, 1844-48 (type loc., "Likely in Southern Ocean?").—Pöhl: Mus. Godeffroy, Cat. 9, p. 38, 1884 (30° S. 170° W.).

Myctophum hyans Schmeltz: op. cit., 2, p. 9, 1865 (South Seas).

BELONIDAE

Belone platyura Bennett.

Belone platyura Rendahl: Nat. Hist. Juan Fernandez and Easter Island, Skottsberg, vol. 3, Zool. pt. 1, p. 62, 1921 (Easter Island).

Belone carinata Schmeltz: Mus. Godeffroy, Cat. 3, p. 11, 1866 (Pacific Ocean).

Strongylura urvillii (Valenciennes).

Tylosurus urvillii Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 11, January-March, 1928 (Santa Cruz Islands).

Strongylura incisa (Valenciennes).

Belone liuroides Schmeltz: Mus. Godeffroy, Cat. 8, p. 7, 1881 (Ponapé).—Pöhl: op. cit., 9, p. 37, 1884 (Ponape).

Strongylura tahitiensis Fowler and Bean.

Belone depressa (non Poey) Schmeltz: Mus. Godeffroy, Cat. 7, p. 57, 1879 (Yap).—Pöhl: op. cit., 9, p. 37, 1884 (Yap).

Stronglura indica (Le Sueur).

Three in the Honolulu markets, April 2.

Strongylura crocodila (Le Sueur).

Belone crocodilus Schmeltz: Mus. Godeffroy, Cat. 3, p. 74, 1866 (Samoa).

Ablennes hians (Valenciennes).

Twenty adults in the Honolulu markets, March 30.

HEMIRAMPHIDAE

Hemiramphus balinensis Bleeker.

Hemirhamphus intermedius (non Cantor) Schmeltz: Mus. Godeffroy, Cat. 7, p. 57, 1879 (Samoa).—Pöhl: op. cit., 9, p. 38, 1884 (Samoa).

Hemiramphus brasiliensis (Linné).

Generally olive above on back and upper surface of head. Entire sides and lower surface bright silvery-white. Iris silvery-white. Top of head with some neutral gray tints, also some subdued rose on frontal region. Mandibular beak neutral or slate-black, tip red, also whole narrow median under surface burnt-sienna, becoming olive and then cream-white basally. Dorsal creamy basally, neutral-gray terminally. Anal white. Caudal gray, with slight olive-yellow tinge. Pectoral grayish above, white below. Ventral whitish, grayish basally. Length 337 mm. Honolulu. R. W. Wehrle.

Hemiramphus erythrorinchus Le Sueur.

Hemiramphus dussumieri Schmeltz: Mus. Godeffroy, Cat. 1, p. 10, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 9, 1865 (South Seas).—Pöhl: op. cit., 9, p. 38, 1884 (South Seas).

Hemirhamphus dussumierii Schmeltz: op. cit., 3, p. 11, 1866 (South Seas).

Hemirhamphus dussumieri Schmeltz: op. cit., 7, p. 57, 1879 (South Seas).

Hemiramphus far (Forskål).

Hemiramphus far Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 11, January-March, 1928 (Santa Cruz Islands).

Zenarchopterus kampeni (Weber).

Male and female, 87 to 125 mm. long, from Morovo Lagoon, Solomon Islands, in the Queensland Museum.

Zenarchopterus dispar (Valenciennes).

One from Gauza River, Vanana Levu, Fiji, in the Queensland Museum.

EXOCOETIDAE

Exocoetus volitans Linné.

Exocoetus evolans Pöhl: Mus. Godeffroy, Cat. 9, p. 38, 1884 (South Seas).

Exocoetus obtusirostris Pöhl: op. cit., 9, p. 38, 1884 (South Seas).

Cypselurus oxycephalus (Bleeker).

One example 250 mm. long from southeast Papua in the Queensland Museum.

Cypselurus rubescens (Rafinesque).

Exocoetus lamellifer Schmeltz: Mus. Godeffroy, Cat. 3, p. 11, 1866 (Pacific Ocean).

Cypselurus nigricans (Bennett).

Exocoetus bicolor Schmeltz: Mus. Godeffroy, Cat. 1, p. 10, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 9, 1865 (South Seas).

Cypselurus bahiensis (Ranzani).

Cypselurus spilonotopterus Whitley: Pan-Pacific Inst., Jour., vol. 2, p. 4, January-March, 1927 (Fiji).—Whitley: op. cit., vol. 3, no. 1, p. 11, January-March, 1928 (Santa Cruz Islands).

Cypselurus simus (Valenciennes).

Cypselurus ogilbyi Whitley: Pan-Pacific Inst., Jour., vol. 2, no. 1, p. 4, January-March, 1927 (Fiji [possibly Jordan and Dickerson's Walpole Island record intended?]).

Cypsilurus unicolor Whitley: op. cit., vol. 3, no. 1, p. 11, January-March, 1928 (Santa Cruz Islands).

CORYPHAENOIDIDAE

Lionurus microlepis (Günther).*

Macrurus microlepis Günther: Rept. voyage "Challenger," vol. 22, p. 124, 1887 (type loc., off Matuku, Fiji Islands, in 315 fathoms).

Lionurus microlepis Whitley: Pan-Pacific Inst., Jour., vol. 2, no. 1, p. 4, January-March, 1927 (Fiji).

Hymenocephalus longibarbus (Günther).*

Macrurus longibarbis Günther: Rept. voyage "Challenger," vol. 22, p. 139, pl. 18, fig. C, 1887 (type loc., off Matuku, Fiji Islands, in 315 fathoms).

Hymenocephalus longibarbus Whitley: Pan-Pacific Inst., vol. 2, no. 1, p. 4, January-March, 1927 (Fiji).

BREGMACEROTIDAE

Bregmaceros mcclellandii Thompson.

Bregmaceros macclellandi Weber and Beaufort: Fishes Indo-Austral Archipelago, vol. 5, p. 6, 1929 (Waigiu, 141 m.).

PLEURONECTIDAE

Arnoglossus tapeinosoma (Bleeker).

Platophrys (*Arnoglossus*) *tapeinosoma* Bleeker: Nederl. Tijdsch. Dierkunde, vol. 3, p. 49, 1866 (type loc., Padang, Sumatra).—Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 127, 1929 (near Waigiu, 141 m.).

I follow Weber and Beaufort in using the above name to replace the later *Arnoglossus macrolophus* Alcock, as used in my "Fishes of Oceania."

Platophrys mancus (Broussonet).

Platophrys smithi Rendahl: Nat. Hist. Juan Fernandez and Easter Island, Skottsberg, vol. 3, Zool. pt. 1, p. 66, 1921 (on reference to *Platophrys mancus* Smith and Swain: U. S. Nat. Mus., Proc., vol. 5, p. 142, 1882, type loc., Johnston Island).

Rendahl has separated the Johnston Island-Hawaiian form from *Platophrys mancus* "by having the scales cycloid and similar on both sides and the nostrils apparently wanting. The teeth are biserially arranged in both jaws." He had but one specimen of *Platophrys mancus* from Easter Island, 111 mm. From this he argues Broussonet's species has the scales of the eyed side ctenoid, those on the blind side cycloid, and pointed teeth in one series in each jaw; also the nostrils described as distinct on both sides of the head. Until more materials are critically studied I hesitate to accept the Johnston-Hawaiian form as distinct.

Platophrys pantherinus (Rüppell).

Rhomboidichthys pantherina Schmeltz: Mus. Godeffroy, Cat. 2, p. 8, 1865 (Samoa).—Schmeltz: op. cit., 3, p. 11, 1866 (Samoa).

Rhomboidichthys pantherinus Schmeltz: op. cit., 7, p. 56, 1879 (Samoa).—Pöhl: op. cit., 9, p. 38, 1884 (Samoa).

Rhomboidichthys pavo Schmeltz: op. cit., 8, p. 7, 1881 (Ponape).—Pöhl: op. cit., 9, p. 38, 1884 (Ponape).

Bothus (*Platophrys*) *pantherinus* Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 123, 1929 (Waigiu).

Left side isabella color or broccoli-brown variegated with pearl-gray to smoke-gray blotches, very irregular and variable, also many cloudings of darker to various shades of neutral-gray, often forming rings to limitations of pale spots. Usually neutral-dusky blotch on interorbital and three well separated large blotches, sometimes variably slate-black, along lateral line. Vertical fins with transparent membranes. Dorsal with about twelve irregular slate-black blotches. Anal with eight and numerous smaller scattered gray spots or dots on each fin ray. Caudal with four of five transverse series of pearl-white and neutral-gray blotches on rays. Paired fins pale, finely dotted with dark-gray. Length 122 to 123 mm. Two from Honolulu. R. W. Wehrle.

One in the Queensland Museum, 180 mm. long, from the Solomon Islands, obtained by A. R. Spencer.

Abundant in the Honolulu markets, March 29-31, and April 1-2.

Scaeops poecilurus (Bleeker).

Bothus (*Arnoglossus*) *poecilurus* Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 131, 1929 (west of New Guinea 32 m.; south of New Guinea).

I follow Weber and Beaufort in uniting *Scaeops spilura*, as used in my "Fishes of Oceania," as a synonym of this species.

Pseudorhombus arsius (Buchanan-Hamilton).

Pseudorhombus arsius Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 105, 1929 (New Guinea).

Pseudorhombus multimaculatus Günther.*

Pseudorhombus multimaculatus Günther: Cat. Fishes Brit. Mus., vol. 4, p. 427, 1862 (type loc., "habitat?").

Rhomboidichthys multimaculatus Pöhl: Mus. Godeffroy, Cat. 9, p. 38, 1884 (South Seas).

Brachypleura novae-zeelandiae (Günther).

Brachypleura novae-zeelandiae Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, 145, 1929 (coast of New Guinea in 54 m.).

The specific name wrongly spelled "*novae-zealandiae*" in my "Fishes of Oceania."

SOLEIDAE

Achirus hartzfeldi Bleeker.

Achirus hartzfeldi Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 160, 1929 (Doreh).

Archirus poropterus Bleeker.

Achirus poropterus Bleeker: Naturk. Tijdschr. Nederl. Indie, vol. 1, p. 410, 1851 (type loc., Batavia; Padang, Western Sumatra).—Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 162, 1929 (Waigiu).

This name replaces *Archirus thepassi*, as used in my "Fishes of Oceania."

Aseraggodes melanostictus (Peters).

In the "Fishes of Oceania" it is stated, "known only from the type," though Mr. Whitley calls my attention to Norman's Queensland record in the recent "Endeavour" Report.

Aseraggodes klunzingeri (Weber).

Aseraggodes klunzingeri Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 157, 1929 (Merauke and Lorentz River, New Guinea).

In my "Fishes of Oceania" *Aseraggodes persimilis* is wrongly spelled "*Asseraggodes*" generically.

Pardachirus pavoninus (Lacépède).

Pardachirus pavoninus Schmeltz: Mus. Godeffroy, Cat. 7, p. 56, 1879 (Tonga Islands).—Weber and Beaufort; Fishes Indo-Austral. Archipelago, vol. 5, p. 165, 1929 (South New Guinea).

Achirus pavoninus Pöhl: op. cit., 9, p. 38, 1884 (South Seas).

Soleichthys heterorhinos (Bleeker).

Solea heterorhina Kner: Wiener Monatsberichte, no. 24, p. —, 1864 (Samoa).

Solea heterochina Schmeltz: Mus. Godeffroy, Cat. 2, p. 8, 1865 (Samoa). (Misprint.)

Solea heterochira Pöhl: op. cit., 9, p. 38, 1884 (South Seas). (Misprint.)

Microbuglossus nigrostriolatus Whitley: Pan-Pacific Inst., Jour., vol. 2, no. 1, p. 4, January-March, 1927 (Fiji).

Brachirus mülleri (Steindachner).

Synaptura mülleri Steindachner: Akad. Wiss. Wien, Sitz., 41, pt. 1, p. 4, 1879 (type loc., Cleveland Bay at Townsville, Queensland).

Brachirus muelleri Norman: Biol. Res. "Endeavour," vol. 5, pt. 5, p. 295, 1926.

This replaces *Brachirus arafurensis* as used in the "Fishes of Oceania."

Brachirus aspilos (Bleeker).

Synaptura aspilos Bleeker: Naturk. Tijdschr. Nederl. Indie, vol. 3, p. 74, 1852 (type loc., Singapore).

Replaces *Brachirus heterolepis* of my "Fishes of Oceania."

Brachirus villosus (Weber).

Synaptura villosa Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 176, 1929 (Wagani, Lorentz River, Mimika River, Merauke).

Cynoglossus kopsii (Bleeker).

Cynoglossus kopsi Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 189, 1929 (Arafura Sea).

Cynoglossus heterolepis Weber.

Cynoglossus heterolepis Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 191, 1929 (Lorentz River).

Symphurus guttatus (Macleay).

Plagusia guttata Macleay: Linn. Soc. New South Wales, Proc., vol. 2, pt. 4, p. 362, 1878 (type loc., Port Darwin, Northern Territory).

Paraplagusia guttata Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 185, 1929 (Merauke River mouth).

This replaces *Symphurus vittatus* in the "Fishes of Oceania."

ANOMALOPIDAE

Anomalops katoptron (Bleeker).

Anomalops katoptron Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 225, 1929 (Doreh).

HOLOCENTRIDAE

Holocentrus ruber (Forskål).

Holocentrum rubrum Schmeltz: Mus. Godeffroy, Cat. 7, p. 36, 1879 (South Sea Islands).—Pöhl: op. cit., 10, p. 30, 1884 (South Seas).—Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 244, 1929 (Waigiu).

Eight from Papua in the Queensland Museum.

Holocentrus caudimaculatus Rüppell.

Holocentrum caudimaculatum Schmeltz: Mus. Godeffroy, Cat. 2, p. 6, 1865 (Samoa).—Schmeltz: op. cit., 7, p. 36, 1879 (Ponape).—Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 247, 1929 (Waigiu; Doreh and Southeast New Guinea).

Holocentrus erythraeus Günther.

Holocentrum erythraeum Pöhl: Mus. Godeffroy, Cat. 10, p. 30, 1884 (Samoa).

Holocentrus tiereoides Bleeker.

Holocentrum tiereoides Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 249, 1929 (New Guinea).

Holocentrus lacteoguttatus Cuvier.

Holocentrum lacteoguttatum Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 240, 1929 (north coast New Guinea).

Holocentrum punctatiss [*imum*] Schmeltz: Mus. Godeffroy, Cat. 2, p. 6, 1865 (Samoa).

Holocentrum punctatissimum Schmeltz: op. cit., 3, p. 6, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 36, 1879 (South Seas).—Pöhl: op. cit., 10, p. 30, 1884 (South Seas).

Holocentrus punctatissimus Rendahl: Nat. Hist. Juan Fernandez and Easter Island, Skottsberg, vol. 3, Zool. pt. 1, p. 63, 1921 (Easter Island).

Holocentrum diploxyphus Schmeltz: op. cit., 7, p. 36, 1879 (Savaii).—Pöhl: op. cit., 10, p. 30, 1884 (Savaii).

When fresh generally lake-red above, silvery-white below. Following in junctures of scale rows on back, general color forms longitudinal lake-red bands alternating with paler geranium-red bands which extend along scale exposures. On lower side geranium-red bands gradually become white and remaining lake-red bands much paler than on back. Iris rose-red. Head above lake-red, with small rosy spot on opercle above, also rose-red bar slightly inclined back and above preopercle spine, well contrasted on white cheek. Vertical lake-red streak down on row of scales on front of opercle, also another from suprascapula along shoulder girdle to pectoral axil. Opercles otherwise and entire under surface of head white. Spinous dorsal pinkish-white, each membrane terminally pale chinese-orange; on first two membranes two large submarginal deep, scarlet vermilion blotches, but on each other membrane submarginally a conspicuous white blotch; also a small whitish blotch on first and second membranes below each scarlet-vermilion blotch; diffuse, deep lake-red blotch at base of each membrane. Rest of soft vertical fins largely orange-chrome, more or less whitish marginally. Pectoral orange-chrome, axil scarlet-vermilion. Ventral pale pinkish-white. Length 124? mm. Honolulu. R. W. Wehrle.

Also four smaller with same data show lake-red on back, paler on sides and under surfaces white. Each row of scales with median longitudinal purple band, not greatly contrasted and less conspicuous on sides of body. Upper surface of head pale-orange, sides and below white with silvery sheen on opercles. Pale rose-purple streak from lower hind eye edge back to lower part of opercle and subopercle, well contrasted with white surrounding area. Spinous dorsal pale-rosy, each membrane terminally with crimson blotch below which a pink-white blotch. Other vertical fins all more or less pale or orange, most intense basally and medially. Paired fins very pale-orange to buff-white. Pectoral axil scarlet. Length 88 to 96 mm.

One in Bishop Museum, 143 mm. long from Pearl and Hermes Reef, April, 1927, obtained by T. Dranga.

One found in the Honolulu market, April 1.

Holocentrus xantherythrus Jordan and Evermann.

Back and upper surface of body scarlet. Each row of scales on body with median narrow band of lake-red and each band much narrower than scarlet interspace; on under surface bands pale-rose to white. Head scarlet, with lake shades around opercular membrane. Broad pink to pinkish-white streak from preorbital to interopercle or across cheek below preopercle spine. This appears as if continued on to breast and chest, due to pale lake bands along each scale row. Iris scarlet-lake. Maxillary with orange-chrome tints, also preorbital. Membranes of spinous dorsal with cadmium-yellow shades, chiefly primrose or straw-yellow, spines orange or scarlet. Soft vertical fins light orange-vermilion, deepest basally and brilliant-scarlet on fourth anal spine. Paired fins very pale-orange; front edge of ventral pale-rose, second membrane with canary-yellow. Pectoral axil orange, with dusky. Length 155 mm. Honolulu. R. W. Wehrle.

This example differs greatly from Jordan and Evermann's reproduction of Baldwin's water-color sketch, which evidently quite faded. It shows the spinous dorsal nearly uniform poppy-red, the narrow bands on the body white, and the cheek without a white oblique band.

Holocentrus laevis Günther.

Holocentrum laeve Schmeltz: Mus. Godeffroy, Cat. 7, p. 36, 1879 (South Sea Islands).—Pöhl: op. cit., 10, p. 30, 1884 (Samoa).

Holocentrus furcatus Günther.

Small example, Honolulu, March 30.

Holocentrus violaceus Bleeker.

Holocentrum violaceum Schmeltz: Mus. Godeffroy, Cat. 3, p. 6, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 36, 1879 (South Seas).—Pöhl: op. cit., 10, p. 30, 1884 (South Seas).—Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 246, 1929 (Waigiu; New Guinea).

Holocentrus laticeps Cuvier.

Holocentrus (Holocentrus) laticeps Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Holocentrus diadema Lacépède.

Holocentrum diadema Schmeltz: Mus. Godeffroy, Cat. 2, p. 6, 1865 (Samoa).—Schmeltz: op. cit., 3, p. 6, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 36, 1879 (South Seas).—Pöhl: op. cit., 9, p. 30, 1884 (South Seas).—Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 238, 1929 (New Guinea).

Upper surface of body scarlet. Each row of scales on back with median narrow band of lake-red; each band much narrower than scarlet interspace; on under surface of body bands become white. Head pale-orange above, sides crimson; row of scales behind vertical limb of preopercle orange, dusted with dusky on opercle medially. Broad white band from lower preorbital below eye and down across cheek in contrast to interopercle below preopercle spine. Lips dull-orange. Under surface of head pale. Iris rose-orange. Spinous dorsal deep clove-brown, end of each membrane, besides narrow subbasal streak over first five membranes, also subterminal blotch on sixth to eighth membranes after which forming subterminal band, white. Other vertical fins all orange, scaly base of soft dorsal scarlet, likewise broad outer border of each caudal lobe, though terminally with slight yellowish tinge; second and third membranes of anal carmine to scarlet-vermilion. Pectoral pale-orange. Ventral with front edge rose-white, then broad band of scarlet-vermilion. Length 164 mm. Honolulu. R. W. Wehrle.

This specimen far more brilliant than Morita's painting as reproduced by Jordan and Evermann, who show an olive to dusky iris and white lips.

Holocentrus microstomus Günther.

Holocentrum microstoma Schmeltz: Mus. Godeffroy, Cat. 7, p. 36, 1879 (Savaii and Tonga Islands).

Holocentrum bleekeri Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 237, 1929 (Geelvink Bay, New Guinea).

Common in Honolulu, March 29 and July 19.

Holocentrus spinifer (Forskål).

Holocentrum spiniferum Schmeltz: Mus. Godeffroy, Cat. 2, p. 6, 1865 (Samoa).—Schmeltz: op. cit., 3, p. 6, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 36, 1879 (South Seas).—Pöhl: op. cit., 9, p. 30, 1884 (South Seas).—Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 235, 1929 (Waigiu; New Guinea).

Holocentrus (Sargocentron) leo Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 11, January-March, 1928 (Santa Cruz Islands).

One at Honolulu, March 29.

Holocentrus sammara (Forskål).

Holocentrum sammara Schmeltz: Mus. Godeffroy, Cat. 2, p. 6, 1865 (Samoa).—Schmeltz: op. cit., 3, p. 6, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 36, 1879 (South Seas).—Pöhl: op. cit., 10, p. 30, 1884 (South Seas).—Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 233, 1929 (Waigiu; New Guinea).

Holocentrum tahiticum Schmeltz: op. cit., 7, p. 36, 1879 (South Seas).

Depth 3 1/4; head 2 7/8, width 2 1/10. Snout 4 in head from snout tip; eye 2 3/4, greater than snout or interorbital; maxillary reaches 1/3 in eye, expansion 1/3, length 3 in head from snout tip; bands of fine villiform teeth in jaws, on vomer and palatines; interorbital 4 1/3, very slightly concave; 2 opercular spines subequal or lower shorter; preopercular spine along upper edge 2 in eye. Gill rakers 6+10, strong, lanceolate, 4/5 of gill filaments; 4 above and 4 below rudimentary.

Tubular scales 38 in lateral line to caudal base and 4 more nontubular on latter; 4 above, 7 below, 5 predorsal, 5 rows on cheek. Scales with 3 basal radiating striae ending with 3 marginal points; single row of 43 apical denticles; circuli very fine.

D. IV, 8, 1, third spine 2 1/5 in total head length, second branched ray 1 9/10; A.IV, 8, 1, third spine 1 2/5, first ray 1 3/4; caudal 1 1/3, deeply forked; least depth of caudal peduncle 4; pectoral 1 3/4; ventral 1 1/2.

Back and upper surfaces lake-red, with shades of geranium-pink on sides. Under surface whitish. Iris yellowish. Snout dull-orange, vermilion above. Spinous dorsal with terminal parts of membranes white, also white spot basally behind each spine; fin grayish-dusky medially, with large black blotch on first to fourth membranes. Fins otherwise largely pale to whitish; front of soft dorsal and soft anal, also each caudal lobe medially and basally, rosy. Pectoral pale rosy. Ventral whitish. Length 158 mm.

One from Honolulu. R. W. Wehrle.

Holocentrus opercularis Valenciennes.

Holocentrum operculare Schmeltz: Mus. Godeffroy. Cat. 3, p. 36, 1879 (Society Islands).—Pöhl: op. cit., 10, p. 30, 1884 (Vavau).

Holocentrus angustifrons Ogilby.*

Holocentrus angustifrons Ogilby: Queensland Mus., Annals, vol. 9, p. 32, October 14, 1908 (type loc., New Britain).

Type no. 1115 in the Queensland Museum. New Britain. Length 150 mm. Captain C. F. Browne.

Holotrachys lima (Valenciennes).

Myripristis lima Pöhl: Mus. Godeffroy, Cat. 9, p. 30, 1884 (Samoa).

Myripristis murdjan (Forskål).

Myripristis murdjan Schmeltz: Mus. Godeffroy, Cat. 7, p. 36, 1879 (Samoa).—Pöhl: op. cit., 9, p. 30, 1884 (Samoa, Viti).—Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 259, 1929 (New Guinea).

Generally flame-scarlet to scarlet-vermilion, each scale with median ill-defined carmine blotch. Broad jet-black blotch bordering edge of opercular portion of gill flap and reflecting below in pectoral axil as large jet-black blotch, only its upper edge showing (beyond) above depressed pectoral. Iris rosy, neutral-black blotch above. Spinous dorsal largely orange-yellow terminally, membranes pinkish medially. Other vertical fins brilliant scarlet-vermilion, all margined golden-yellow, front edge of second dorsal and anal narrowly mauve. Paired fins pale-scarlet or rose-pink, lower front edge of ventral narrowly pearl-white terminally. Two, 176 to 198 mm. Honolulu. R. W. Wehrle.

Both these differ from Baldwin's water color, reproduced by Jordan and Evermann, in that the soft vertical fins are largely scarlet-vermilion and the submarginal yellow inconspicuous. On the other hand, they also have the spinous dorsal terminally brilliant-orange, the head without any yellow, likewise the ventrals.

Common in the Honolulu markets, July 19.

Myripristis praslinus Cuvier.

Myripristis pralinius Rendahl: Nat. Hist. Juan Fernandez and Easter Island, Skottsberg, vol. 3, Zool. pt. 1, p. 62, 1921 (Easter Island).—Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 253, 1929 (Dorch, New Guinea).

?Myripristis jacobus Pöhl: Mus. Godeffroy, Cat. 9, p. 30, 1884 (Apia).

Weber and Beaufort unite *Myripristis multiradiatus* Günther with this species, which may be suppressed in my "Fishes of Oceania."

SYNGNATHIDAE

Syngnathoides biaculeatus (Bloch).

Gasterotokeus aculeatus Schmeltz: Mus. Godeffroy, Cat. 3, p. 13, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 61, 1879 (Tonga Islands).

Gastrotokeus biaculeatus Pöhl: op. cit., 9, p. 41, 1884 (Tonga).

One at Honolulu, March 29, common July 19.

Coelonotus liaspis (Bleeker) (fig. 1).

Depth 10 1/2 to vent, 25 to caudal base; head 3 1/2 to vent, 9 to caudal base, width 4 in its length. Snout 2 1/3 in head from snout tip; eye 5 2/3, 2 in snout, greater than interorbital; mandible protruded, mouth superior, short; interorbital 5 4/5, very slightly concave; opercle without keel.

Rings 17+38; subdorsal rings 4+9; superior keels only distinct, incomplete on subdorsal rings where parallel and unite below last dorsal rays; median lateral trunk keel and lower caudal keel continuous; other keels feeble or little developed.

Depth 50, uniformly low: A. very small, length about half of eye; caudal half of head; pectoral short, broad, rays 21.

Color largely uniform dark brown. Length 100 mm.

One in Bishop Museum, from a small stream of fresh water, Raiatea, October 30, 1920. J. W. Moore.

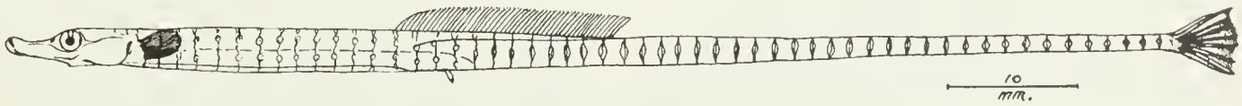


FIGURE 1.—*Coelonotus liaspis* (Bleeker).

Weber and Beaufort unite *M. violaceus, M. adustus* and *M. microphthalmus* with this species.

Myripristis adustus Bleeker.

Myripristis adustus Schmeltz: Mus. Godeffroy, Cat. 3, p. 6, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 36, 1879 (Samoa).—Pöhl: op. cit., 9, p. 30, 1884 (South Seas).

Myripristis hexagonus (Lacépède).

Myripristes hexagonus Schmeltz: Mus. Godeffroy, Cat. 1, p. 8, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 6, 1865 (Samoa).

Myripristis hexagonus Schmeltz: op. cit., 3, p. 6, 1866 (South Seas).—Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 256, 1929 (New Guinea).

Weber and Beaufort unite *Myripristis pahudi* Bleeker with this species, which may, therefore, be suppressed in my "Fishes of Oceania."

Myripristis argyromus Jordan and Evermann.

One at Honolulu, July 19.

Doryrhamphus melanopleura (Bleeker).

Doryrhamphus melanopleura Whitley: Pan-Pacific Inst., Jour., vol. 2, no. 1, p. 4, January-March, 1927 (Fiji), p. 8 (Rotuma).

Doryichthys pleurotaenia Whitley: op. cit., p. 8, January-March, 1927 (Rotuma).

Doryrhamphinarum brachyurum (Bleeker).

Doryichthys brachyurus Schmeltz: Mus. Godeffroy, Cat. 7, p. 61, 1879 (Rarotonga, Viti Islands).—Pöhl: op. cit., 9, p. 41, 1884 (Viti).

Stigmatophora nigra Kaup.*

Stigmatophora nigra Kaup: Cat. Fish Brit. Mus. Lophobr., p. 53, 1856 (type loc., Tasmania).—Whitley: Pan-Pacific Inst., Jour., vol. 2, no. 1, p. 4, January-March, 1927 (Fiji).

Syngnathus margaritifer Peters.*

Syngnathus margaritifer Peters: Akad. Wissensch. Berlin, Monatsb., p. 457, 1868 (type loc., Sydney).—Schmeltz: Mus. Godeffroy, Cat., 7, p. 61, 1879 (Boston Island).

Syngnathus semistriatus (Kaup).*

Leptonotus semistriatus Kaup: Cat. Fish Brit. Mus. Lophobr., p. 48, 1856 (type loc., "origin is not noted" British Museum).

Syngnathus semistriatus Whitley: Pan-Pacific Inst., Jour., vol. 2, no. 1, p. 4, January-March, 1927 (Fiji).

Corythoichthys conspicillatus (Jenyns).

Syngnathus conspicillatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 61, 1879 (Viti Islands).—Pöhl: op. cit., 9, p. 41, 1884 (South Seas).

One in Bishop Museum, 47 mm. long, obtained at Guam in 1926 by Lieut. H. Hornbostel.

Hippocampus kuda Bleeker.

Hippocampus novae-hollandiae (non Steindachner) Schmeltz: Mus. Godeffroy, Cat., 7, p. 61, 1879 (Viti Islands).—Pöhl: op. cit., 9, p. 42, 1884 (Viti Levu).

Hippocampus guttulatus Schmeltz: op. cit., 7, p. 61, 1879 (Tonga Islands).—Pöhl: op. cit., 9, p. 42, 1884 (South Seas).

Hippocampus foliatus Perry.*

Hippocampus foliatus Perry: Arcana, pl. 48, 1810 (type loc., Botany Bay).—Whitley: Pan-Pacific Inst., Jour., vol. 2, no. 1, p. 4, January-March, 1927 (Fiji).

PEGASIDAE

Parapegasus natans (Linné).

Nine from Papua in the Queensland Museum.

AULOSTOMIDAE

Aulostomus chinensis (Linné).

Aulostoma chinense Schmeltz: Mus. Godeffroy, Cat. 2, p. 8, 1865 (Samoa).—Schmeltz: op. cit., 7, p. 51, 1879 (Samoa and Tahiti).—Pöhl: op. cit., 9, p. 34, 1884 (Samoa).

FISTULARIIDAE

Fistularia petimba Lacépède.

Fistularia tabaccaria (non Linné) Schmeltz: Mus. Godeffroy, Cat. 2, p. 8, 1865 (Samoa).

Fistularia serrata (non Cuvier?) Schmeltz: op. cit., 7, p. 51, 1879 (South Seas).—Pöhl: op. cit., 9, p. 34, 1884 (South Seas), p. 45 (New Guinea).

?Gasterosteus serratus Pöhl: op. cit., 10, p. 30, 1884 (South Seas).

Fistularia depressa Schmeltz: op. cit., 8, p. 6, 1881 (Ponape).—Pöhl: op. cit., 9, p. 34, 1884 (Ponape).

One about 750 mm. in Honolulu, March 30.

CENTRISCIDAE

Centriscus strigatus (Günther).

Amphisile strigata Schmeltz: Mus. Godeffroy, Cat. 7, p. 51, 1879 (Pelew Islands).—Pöhl: op. cit., 9, p. 34, 1884 (Pelew [Palau] Islands).

ATHERINIDAE

Atherina endrachtensis Quoy and Gaimard.

Atherina endrachtensis Whitley: Pan-Pacific Inst., Jour., vol. 2, no. 1, p. 4, January-March, 1927 (Fiji).

Hepsetia insularum (Jordan and Evermann).

Several at Honolulu, March 29.

Hepsetia lacunosa (Schneider).

Hepsetia lacunosa Whitley: Pan-Pacific Inst., Jour., vol. 2, no. 1, p. 4, January-March, 1927 (Fiji).

Atherina lacunosa Whitley: op. cit., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Hepsetia pinguis (Lacépède).

Atherina pinguis Schmeltz: Mus. Godeffroy, Cat. 1, p. 9, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 7, 1865 (South Seas).—Schmeltz: op. cit., 3, p. 10, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 50, 1879 (South Seas).—Pöhl: op. cit., 9, p. 34, 1884 (South Seas).

One of 100 mm. from Port Moresby, Papua, in the Queensland Museum.

Melanotaenia nigrans (Richardson).

One from Papua in the Queensland Museum.

Rhombosoma goldiei (Macleay).

Type of *Nematocentris novae-guineae* Ramsay and Ogilby, from the Strickland River, Papua. Four specimens, no. 860 in the Queensland Museum.

MUGILIDAE

Mugil argenteus Quoy and Gaimard.

Mugil argenteus Schmeltz: Mus. Godeffroy, Cat. 3, p. 10, 1866 (South Seas).

Mugil tade Forskål.

Mugil kandavensis Schmeltz: Mus. Godeffroy, Cat. 7, p. 51, 1879 (Kandavu).

Mugil decemradiatus (non Günther 1861) Pöhl: op. cit., 9, p. 34, 1884 (Kandavu).

One seen in the market at Suva, Fiji, July 12.

Mugil engeli Bleeker.

Mugil kelaartii Schmeltz: Mus. Godeffroy, Cat. 8, p. 6, 1881 (Ponape).

Mugil kelaertii Pöhl: op. cit., 9, p. 34, 1884 (Ponape).

Mugil vaigiensis Quoy and Gaimard.

Liza vaigiensis Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Liza melinoptera Whitley: op. cit. (Santa Cruz Islands).

Mugil macrolepis Andrew Smith.

Mugil troscheli Schmeltz: Mus. Godeffroy, Cat. 7, p. 50, 1879 (Viti Islands).

Several seen in the Suva market, July 12.

Mugil seheli Forskål.

Six in the Suva market, July 12.

Mugil cephalus Linné.

Mugil cephalotes Schmeltz: Mus. Godeffroy, Cat. 7, p. 50, 1879 (Gayndah, Tonga Islands).

Abundant in the Honolulu markets, all ages, March 30, 31, April 1, 2, July 19.

Mugil crenilabis Forskål.

Mugil crenilabris Pöhl: Mus. Godeffroy, Cat. 9, p. 34, 1884 (Ponape). (Misprint.)

Mugil crenilabis Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Mugil perusii Valenciennes.*

Mugil perusii Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Mugil peronii Valenciennes.

Mugil peronii Valenciennes: Hist. Nat. Poiss., vol. 11, p. 102, 1836 (type loc., Port Western, northwest

coast of Australia).—Schmeltz: Mus. Godeffroy, Cat. 7, p. 51, 1879 (Tonga Islands).

Cestraeus plicatilis Valenciennes.

Agonostoma plikatile Schmeltz: Mus. Godeffroy, Cat. 8, p. 6, 1881 (Viti).

SPHYRAENIDAE

Sphyraena barracuda (Walbaum).

Sphyraena commersonii Schmeltz: Mus. Godeffroy, Cat. 7, p. 44, 1879 (Viti Islands).

In Honolulu markets, 40 on March 30, 10, March 31, 2, April 2.

Sphyraena forsteri Cuvier.

Sphyraena forsteri Schmeltz: Mus. Godeffroy, Cat. 8, p. 6, 1881 (Ponape).—Pöhl: op. cit., 9, p. 34, 1884 (Ponape).

Sphyraena novae-hollandiae Günther.*

Sphyraena novae-hollandiae Günther: Cat. Fishes Brit. Mus., vol. 2, p. 335, 1860 (type loc., Hobson's Bay, Port Phillip, Australia).—Whitley: Pan-Pacific Inst., Jour., vol. 2, no. 1, p. 5, January-March, 1927 (Fiji).

POLYNEMIDAE

Polydactylus plebeius (Bonnaterre).

Polynemus plebeius Schmeltz: Mus. Godeffroy, Cat. 7, p. 44, 1879 (South Seas).

Polynemus plebejus Pöhl: op. cit., 9, p. 30, 1884 (Upolu).

Polynemus taeniatus Schmeltz: op. cit., 3, p. 8, 1866 (Samoa).

Polydactylus sexfilis (Valenciennes).

Back pale-olive, sides becoming pinkish or salmon-buff, lower body edge white. At junctures of scales each row on back above lateral line with distinct rather dark narrow longitudinal olive band or line, narrower than pale interspaces and pale or indistinct below lateral line. Iris shows through transparent light-brown adipose eyelid as vinaceous-pink. Snout clay-color. Mandible white. Dorsals pale-olive basally, neutral-dusky or slate terminally. Caudal largely pale-brown, marginally neutral-slate. Anal with pale to whitish borders, medially with yellow-ochre tinge dusted with neutral-dusky. Pectorals cream-white, terminally tinge of yellow-ochre dusted with neutral-dusky; six filaments white. Ventrals cream-white; slightly dusted gray terminally. Length 283 mm. Honolulu. R. W. Wehrle.

Ten seen in Honolulu markets, March 30, one March 31, one July 19.

SCOMBRIDAE

Scomber japonicus Hottuyn.

In Honolulu, six March 31, two April 1.

Scomber kanagurta Rüppell.

Scomber microlepidotus Schmeltz: Mus. Godeffroy, Cat. 7, p. 6, 1881 (New Britain Archipelago).

Several in the market at Suva, Fiji, July 12.

Rastrelliger brachysoma (Bleeker).

Six in the market at Suva, July 12.

Euthynnus pelamis (Linné).

Abundant in Honolulu, March 30; fifteen March 31; common April 1, 2.

Euthynnus alletteratus (Rafinesque).

Adult at Honolulu, April 1.

Thunnus thynnus (Linné).

One adult at Honolulu, April 2.

Germo alalunga (Gmelin).

In Honolulu, two March 30, two March 31, one April 1, two April 2, one July 19.

Germo sibi (Schlegel).

One in Honolulu, March 30, two March 31, one April 1, two April 2.

Germo macropterus (Schlegel).

Neothunnus macropterus Whitley: Pan-Pacific Inst., Jour.; vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Saw one adult in Honolulu market, March 30.

Acanthocybium solandri (Cuvier).

One adult in Honolulu market, March 30.

ISTIOPHORIDAE

Tetrapturus mitsukurii Jordan and Snyder.

Two in Honolulu market, March 30, one March 31, one April 1, one April 2.

XIPHIIDAE

Xiphias gladius Linné.

Xiphias gladius Jordan: Pan-Pacific Inst., Jour., vol. 2, no. 4, p. 5, October-December, 1927 (Samoa).

CORYPHAENIDAE

Coryphaena hippurus Linné.

Ten in Honolulu market, March 30, one April 1, twelve April 2, three July 19.

CENTROLOPHIDAE

Schedophilus maculatus Günther.

Schedophilus maculatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 45, 1879 (South Seas).

Schedophilus marmoratus Schmeltz: op. cit., 3, p. 8, 1866 (South Seas).—Schmeltz: op. cit., 7, p. 45, 1879 (South Seas).

CARANGIDAE

Scomberoides toloo parah (Rüppell).

Chorinemus toloo Schmeltz: Mus. Godeffroy, Cat. 3, p. 9, 1866 (Samoa).

Scomberoides toloo Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Scomberoides sancti-petri (Cuvier).

Chorinemus sancti-petri Schmeltz: Mus. Godeffroy, Cat. 7, p. 45, 1879 (Viti Islands).—Pöhl: op. cit., 10, p. 31, 1884 (Viti).

Back gray, lighter on sides and becoming white below. Whole body overshot with bright silvery-white. Iris white. Soft dorsal white, lobe terminally neutral black. Caudal dusky-gray. Other fins white. Length 235 mm. Honolulu. R. W. Wehrle.

Four half-grown at Honolulu, March 30.

Seriola purpurascens Schlegel.

Seriola dumerilii Pöhl: Mus. Godeffroy, Cat. 9, p. 31, 1884 (New Britain).

In Honolulu markets, ten March 30, twenty March 31, three April 1, ten April 2.

Naucrates ductor (Linné).

Naucrates ductor Schmeltz: Mus. Godeffroy, Cat. 3, p. 8, 1866 (South Seas).—Schmeltz: op. cit., 7, p. 44, 1879 (South Seas).—Pöhl: op. cit., 9, p. 31, 1884 (South Seas).

Neucrates indicus Schmeltz: op. cit., 2, p. 7, 1865 (South Seas).

Elagatis bipinnulatus (Quoy and Gaimard).

Seriolichthys bipinnulat[us] Schmeltz: Mus. Godeffroy, Cat. 8, p. 6, 1881 (New Britain Archipelago).

Three in Honolulu markets, April 1.

Decapterus sanctae-helenae (Cuvier).

Caranx sanctae-helenae Schmeltz: Mus. Godeffroy, Cat. 7, p. 45, 1879 (Tahiti).

Caranx pinnulatus Pöhl: op. cit., 10, p. 31, 1884 (Tahiti).

Ten in Honolulu, March 30; fifty, July 19.

Selar boops (Cuvier).

Selar boops Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Selar crumenophthalmus (Bloch).

Caranx crumenophthalmus Schmeltz: Mus. Godeffroy, Cat. 2, p. 7, 1865 (Samoa).—Schmeltz: op. cit., 3, p. 9, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 45, 1879 (Samoa and Tonga).—Pöhl: op. cit., 9, p. 31, 1884 (Samoa).

Selar torvus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Abundant in Honolulu markets, March 30, 31, April 1, 2.

Trachurus trachurus (Linné).

Trachurus trachurus Pöhl: Mus. Godeffroy, Cat. 10, p. 31, 1884 (South Seas).

Caranx djeddaba (Forskål).*

Scomber djedaba Forskål: Descriptiones animalium, pp. xii, 56, 1775 (type loc., Lohaja; Djedda, Suez).

Caranx djeddaba Schmeltz: Mus. Godeffroy, Cat. 1, p. 9, 1864 (South Seas).

Caranx mate Cuvier.

Common in Honolulu markets, March 30, April 1, July 19.

Caranx ascensionis (Osbeck).

Caranx ascensionis Schmeltz: Mus. Godeffroy, Cat. 8, p. 6, 1881 (Ponape).

Caranx ascensiones Pöhl: op. cit., 9, p. 31, 1884 (Ponape).

Caranx melampygos Schmeltz: op. cit., 7, p. 45, 1879 (Upolu and Tahiti).—Pöhl: op. cit., 10, p. 31, 1884 (Upolu).

Caranx melampygus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Six in Honolulu markets, March 30, one March 29, two March 31, one April 1, one April 2.

Caranx cheilio (Snyder).

Three in Honolulu markets, March 30, five March 31, one April 1, one April 2, one July 19.

Caranx ignobilis (Forskål).

Caranx hippos (non Linné) Schmeltz: Mus. Godeffroy, Cat. 7, p. 45, 1879 (Tonga Islands).—Pöhl: op. cit., 10, p. 31, 1884 (Tonga Islands).

Caranx kalla Cuvier.

Caranx parasitus Whitley: Pan-Pacific Inst., Jour., vol. 2, no. 1, p. 5, January-March, 1927 (Fiji).

Caranx lugubris Poey.

In Honolulu markets, ten March 30, three March 29, one April 1, one April 2.

Caranx sexfasciatus Quoy and Gaimard.

Caranx sexfasciatus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Caranx marginatus Pöhl: Mus. Godeffroy, Cat. 10, p. 31, 1884 (Samoa).

Caranx forsteri Whitley: op. cit., p. 11 (Santa Cruz Islands).

Caranx peronii Whitley: op. cit., p. 11 (Santa Cruz Islands).

Back drab-gray, sides and below silvery-white. Iris silvery-white, with pink tinge. Lips cream-white, slightly yellow in front. Dorsals gray-white, spines and rays with slightly pale-olive tinge, fins all darker gray marginally. Caudal cream-buff basally, hind margin and ends of lobes deep neutral-gray. Anal gray-white, tinge of pale-yellow at base of long front lobe, which neutral-dusky or slate-black terminally. Pectoral lemon-yellow, lower or shorter rays cream-white. Ventral cream-white. No dark spot on opercular membrane. Length 215 mm. Honolulu. R. W. Wehrle.

Six in Honolulu markets, March 30, one April 1, one April 2, forty July 19.

Carangichthys typus Bleeker.*

Carangichthys typus Bleeker: Naturk. Tijds. Nederland. Indie, vol. 3, p. 760, 1852 (type loc., Kema, North Celebes).—Schmeltz: Mus. Godeffroy, Cat. 3, p. 9, 1866 (Samoa).

Gnathanodon speciosus (Forskål).

Caranx speciosus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Gnathanodon leptolepis (Cuvier).

Caranx leptolepis Pöhl: Mus. Godeffroy, Cat. 10, p. 31, 1884 (South Seas).

Carangoides ferdau (Forskål).

Caranx ferdau Schmeltz: Mus. Godeffroy, Cat. 7, p. 45, 1879 (Viti Islands).—Pöhl: op. cit., 10, p. 31, 1884 (Viti).

Carangoides gymnostethus Bleeker.

Four in Honolulu markets, April 1.

Carangoides oblongus (Cuvier).

Caranx oblongus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Carangoides armatus (Forskål).

Caranx armatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 45, 1879 (Samoa Islands).—Schmeltz: op. cit., 8, p. 6, 1881 (Samoa).

Blepharis ciliaris (Bloch).

Caranx ciliaris Schmeltz: Mus. Godeffroy, Cat. 7, p. 45, 1879 (Pelew [Palau] Islands).

One in Waikiki aquarium, Honolulu, March 29. At least 250 mm. long and with dark transverse bands arching forward. Dorsal filaments 350 to 400 mm.

Scyris indica Rüppell.

Caranx gallus (non Linné) Schmeltz: Mus. Godeffroy, Cat. 7, p. 45, 1879 (Viti Islands).

Trachinotus ovatus (Linné).

Trachynotus ovatus Schmeltz: Mus. Godeffroy, Cat. 3, p. 9, 1866 (Samoa).

Trachinotus falcatus Jordan: Pan-Pacific Inst., Jour., vol. 2, no. 4, p. 5, October-December, 1927 (Samoa: evidently from Schmeltz).

RACHYCENTRIDAE

Rachycentron canadum (Linné).*

Gasterosteus canadus Linné: Systema naturae, ed. 12, vol. 1, p. 491, 1766 (type loc., Carolina).

Rachycentron pondicerianum Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

LEIOGNATHIDAE

Leiognathus equula (Forskål).

Large specimen nearly 200 mm. long seen in the market at Suva, July 12.

Leiognathus fasciatus (Lacépède).

Equula fasciata Schmeltz: Mus. Godeffroy, Cat. 3, p. 9, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 46, 1879 (South Seas).—Pöhl: op. cit., 9, p. 32, 1884 (Samoa).

Equula filigera Schmeltz: op. cit., 1, p. 9, 1864 (South Seas).—Schmeltz. op. cit., 2, p. 7, 1865 (Samoa).

Gazza minuta (Bloch).

Gazza minuta Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

AMIIDAE (=CHEILODIPTERIDAE)

Amia nematoptera (Bleeker).

Apogon nematopterus Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 335, 1929 (New Guinea).

Three, 50 to 68 mm. long, from Papua in the Queensland Museum.

Amia orbicularis (Cuvier).

Apogon orbicularis Schmeltz: Mus. Godeffroy, Cat. 7, p. 38, 1879 (Pelew [Palau] Islands and Ponape).—Pöhl: op. cit., 9, p. 26, 1884 (Pelew Islands).—Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 333, 1929 (Waigiu: New Guinea).

One, 79 mm. long, obtained at the Solomon Islands by Mr. A. R. Spencer, now in the Queensland Museum.

Amia trimaculata (Cuvier).

Apogon trimaculatus Weber and Beaufort; Fishes Indo-Austral. Archipelago, vol. 5, p. 335, 1929 (New Guinea).

[*Amia rhodoptera* Fowler and Bean: U. S. Nat. Mus., Bull. 100, vol. 10, p. 34, 1930 (Philippines and Celebes).]

Subsequent studies seem to show that *Amia koilomatodon* (Bleeker) is slightly distinct, although it has been united with the present species by Weber and Beaufort.

Amia trifasciata (Weber).

Apogon trifasciatus Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 288, fig. 77, 1929 (Lorentz River basin, New Guinea).

Amia sandei (Weber).

Apogon sandei Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 284, fig. 75, 1929 (Wagami, Mimika, Lorentz and Upper Digul Rivers, New Guinea).

Amia gjellerupi (Weber and Beaufort).*

Apogon gjellerupi Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 285, 1929 (type loc., Kaiserin Augusta River; Idenburg, Mamberamo and Otker Rivers, New Guinea).

Amia heurni (Weber and Beaufort).*

Apogon heurni Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 286, 1929 (type loc., Idenburg River; Otker River and tributary Mamberamo River, New Guinea).

Amia wichmanni (Weber).

Apogon wichmanni Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 289, fig. 78, 1929 (Sermowai, Tawarin, Sekanto, Mosso Rivers, Lake Sentani, Zoutbron, Njao, New Guinea).

Amia koilomatodon (Bleeker).

Apogon koilomatodon Bleeker: Naturk. Tijdschr. Nederl. Indie, vol. 4, p. 134, 1853 (type loc., Ternate).

[*Amia koilomatodon* Fowler and Bean: U. S. Nat. Mus., Bull. 100, vol. 10, p. 37, 1930 (Philippines, Borneo, Celebes, Moluccas).]

Apogon trimaculatus (non Cuvier) Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 335, 1929 (part; type of *Apogon koilomatodon* Bleeker).

The above name will replace *Amia rhodopterus* in my "Fishes of Oceania."

Amia hartzfeldii (Bleeker).

Apogon hartzfeldi Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 311, 1929 (Doreh, New Guinea).

Amia bandanensis (Bleeker).

Apogon bandanensis Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 317, 1929 (Doreh and Atjatuning).

Apogon cupreus Schmeltz: Mus. Godeffroy, Cat. 5, p. 7, 1866 (South Seas).

Apogon savayensis Schmeltz: op. cit., 7, p. 38, 1879 (Samoa Islands).—Pöhl: op. cit., 9, p. 26, 1884 (Apia).

Amia novemfasciata (Cuvier).

Apogon novemfasciatus Schmeltz: Mus. Godeffroy, Cat. 1, p. 9, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 5, 1865 (Samoa).—Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).—Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 302, 1929 (Waigiu; Doreh, New Guinea).

Apogon fasciatus (non White) Schmeltz: op. cit., 3, p. 7, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 38, 1879 (South Sea Islands).—Pöhl: op. cit., 9, p. 26, 1884 (South Seas).

Apogon fasciata stevensi McCulloch: Biological Results "Endeavour," vol. 3, pt. 3, p. 118, pl. 16, fig. 2, April 21, 1915 (type loc., New Hebrides: Suva, Fiji).

Apogon fasciatus stevensi Whitley: Pan-Pacific Inst., Jour., vol. 1, no. 2, p. 5, January-March, 1927 (Fiji).

Amia aroubiensis (Hombron and Jacquinot).

Apogon fasciatus aroubiensis Whitley: Pan-Pacific Inst., Jour., vol. 1, no. 2, p. 5, January-March, 1927 (Fiji).

Amia endekataenia (Bleeker).*

Apogon endekataenia Bleeker: Naturk. Tijdschr. Nederl. Indie, vol. 3, p. 449, 1852 (type loc., "Banka vel Insul. Lepar").—Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 306, 1929 (New Guinea).

Amia quadrifasciata Cuvier.*

Apogon quadrifasciatus Cuvier: Hist. Nat. Poiss., vol. 2, p. 113, 1828 (type loc., Pondicherry).

Apogon quadrifasciata Whitley: Pan-Pacific Inst., Jour., vol. 1, no. 2, p. 5, January-March, 1927, (Fiji).

Amia frenata (Valenciennes).

Apogon frenatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 38, 1879 (Tahiti).—Pöhl: op. cit., 9, p. 26, 1884 (Tahiti).—Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 295, 1929 (Tarfia, Tana merah and Humboldt Bays, New Guinea).

Common in the Honolulu markets, July 19.

Amia amboinensis (Bleeker).

Apogon amboinensis Schmeltz: Mus. Godeffroy, Cat. 7, p. 38, 1879 (Kandavu).—Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 340, 1929 (Waigiu; New Guinea).

Amia ceramensis (Bleeker).

Apogon uramensis Pöhl: Mus. Godeffroy, Cat. 9, p. 26, 1884 (South Seas). (Misprint.)

Apogon ceramensis Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 338, 1929 (New Guinea).

Amia beauforti (Weber).

Apogon beauforti Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 287, fig. 76, 1929 (Lake Sentani, Humboldt Bay, Idenburg, Mamberamo and Lorentz Rivers, New Guinea).

Amia exostigma Jordan and Seale.*

Fowler and Bean have found Philippine materials constantly differing from the closely related *Amia frenata,* with which Weber and Beaufort include it.

Amia fusca (Quoy and Gaimard).

Apogon monochrous Schmeltz: Mus. Godeffroy, Cat. 3, p. 7, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 38, 1879 (Samoa).—Pöhl: op. cit., 9, p. 26, 1884 (South Seas).

Amia maculosa (Valenciennes).

Apogon maculosus Schmeltz: Mus. Godeffroy, Cat. 3, p. 7, 1866 (South Seas).

Amia sangiensis (Bleeker).

Apogon sangiensis Schmeltz: Mus. Godeffroy, Cat. 7, p. 38, 1879 (Yap).—Pöhl: op. cit., 9, p. 26, 1884 (Yap).—Whitley: Pan-Pacific Inst., Jour., vol. 7, no. 2, p. 5, January-March, 1927 (Fiji).—Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 343, 1929 (Waigiu: New Guinea).

Amia hyalosoma (Bleeker).

Apogon hyalosoma Schmeltz: Mus. Godeffroy, Cat. 7, p. 38, 1879 (South Seas).—Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 341, 1929 (Humboldt Bay, New Guinea).

Amia fleurieu (Lacépède).

Apogon aureus Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 319, 1929 (Doreh, North New Guinea, British New Guinea).

Amia dammermani (Weber and Beaufort).*

Apogon dammermani Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 338, 1929 (type loc., North New Guinea).

Amia melas (Bleeker).*

Apogon melas Bleeker: Journal Indian Archipelago, vol. 2, p. 635, 1848 (type loc., Bima, Sumbawa).—Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 309, 1929 (Waigiu).

As Weber and Beaufort include *Apogon hypselonotus* Bleeker as a synonym of this species, in my "Fishes of Oceania" it will give way to *Apogon leptacanthus* Bleeker.

Amia leptacantha (Bleeker).*

Apogon leptacanthus Bleeker: Naturk. Tijdschr. Nederl. Indie, vol. 12, p. 204, 1856-57 (type loc., Ternate).—Schmeltz: Mus. Godeffroy, Cat. 1, p. 7, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 5, 1865 (South Seas).—Schmeltz: op. cit., 3, p. 7, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 38, 1879 (South Seas).—Pöhl: op. cit., 9, p. 26, 1884 (South Seas).—Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 344, 1929 (New Guinea).

[*Amia hypselonota* (non Bleeker) Fowler and Bean: U. S. Nat. Mus., Bull. 100, vol. 10, p. 90, 1930 (Philippines).]

Amia laterale (Valenciennes).

Apogon lateralis Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Amia nigripinnis (Cuvier).

Apogon nigripinnis Pöhl: Mus. Godeffroy, Cat. 9, p. 27, 1884 (Ponape).

Amia novae-guineae (Valenciennes).

Apogon novae-guineae Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 332, 1929 (New Guinea).

Amia tubulata (Weber).

Apogon tubulatus Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 293, 1929 (near west coast of New Guinea 32 m.).

Amia taenioptera (Bennett).

Apogon taeniopterus Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 298, 1929 (New Guinea).

Amia nematacantha Ogilby.*

Amia nematacantha Ogilby: Queensland Mus., Mem. vol. 2, p. 85, pl. 22, fig. 1, 1913 (type loc., Darnley Island).

In the Queensland Museum, 3 specimens 38 mm. long, from Papua.

Mionorus graeffii (Günther).

Apogon graeffei Schmeltz: Mus. Godeffroy, Cat. 7, p. 38, 1879 (Boston Island).—Pöhl: op. cit., 9, p. 26, 1884 (Boston Island).

Zoramia graeffii Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Mionorus waikiki (Jordan and Evermann).

One from Waikiki, 53 mm. long, in 1922, in Bishop Museum.

Bishop Museum has one from Guam, 72 mm long, obtained by Lieut. H. Hornbostel in 1926.

Apogonichthys auritus (Valenciennes).

Apogon auritus Schmeltz: Mus. Godeffroy, Cat. 3, p. 7, 1866 (South Seas).—Schmeltz: op. cit., 7, p. 38, 1879 (Tahiti).—Pöhl: op. cit., 9, p. 27, 1884 (Samoa and Tahiti).—Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 325, 1929 (Strait Galewo, New Guinea).

Apogonichthys perdix Bleeker.

One in Bishop Museum, 45 mm. long, from Guam, Lieut. Hornbostel, 1926.

Siphamia argyrogaster (Weber).

Apogon argyrogaster Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 294, 1929 (type).

Evidently the same as the Philippine *Amia versicolor* Smith and Radcliffe 1912.

Archamia buruensis (Bleeker).

Apogon buroënsis Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 345, 1929 (New Guinea).

Fowler and Bean (U. S. Nat. Mus., Bull. 100, vol. 10, p. 120, 1930) made *Apogonichthys gracilis* Bleeker the type of a new group as *oxal,* overlooking the fact that the genotype of *Rhabdamia* Weber 1909 is *Rhabdamia clupeiformis* Weber, which is a synonym of *Apogonichthys gracilis* Bleeker=*Archamia gracilis* (Bleeker). As here understood both *Rhabdamia* and *Ioamia* are synonyms of *Archamia.*

Archamia zosterophora (Bleeker).

Apogon zosterophorus Weber and Beaufort: Fishes of Indo-Austral. Archipelago, vol. 5, p. 346, 1929 (New Guinea).

Archamia lineolata (Cuvier).

Archamia lineolata Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Apogon lineolatus Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 347, 1929 (New Guinea).

Apogon bleekerii Schmeltz: Mus. Godeffroy, Cat. 3, p. 7, 1866 (Samoa).

Cheilodipterus lineatus (Linné).

Chilodipterus lineatus Pöhl: Mus. Godeffroy, Cat. 9, p. 27, 1884 (Tahiti).

Chilodipterus octovittatus Schmeltz: op. cit., 3, p. 7, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 39, 1879 (Society Islands).—Pöhl: op. cit., 9, p. 27, 1884 (South Seas).

Cheilodipterus macrodon Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 363, 1929 (New Guinea).

One in the Queensland Museum, 55 mm. long, from the Solomon Islands, obtained by Mr. R. S. Spencer.

Cheilodipterus quinquelineatus Cuvier.

Chilodipterus quinquelineatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 38, 1879 (Tahiti).

Cheilodipterus quinquelineatus Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 361, 1929 (New Guinea).

Four from Papua, 75 to 106 mm. long, in the Queensland Museum.

Cheilodipterus singapurensis Bleeker.

Cheilodipterus singapurensis Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 360, 1929 (Waigiu).

CHANDIDAE (=AMBASSIDAE)

Ambassis safgha (Forskål).

Sciaena safgha Forskål: Descriptiones animalium, pp. XII, 53, 1775 (type loc., Arabia).

Ambassis commersonii Pöhl: Mus. Godeffroy, Cat. 9, p. 26, 1884 (Uea).

Ambassis commersoni Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 406, 1929 (Klipong River; British New Guinea).

The above name replaces *Ambassis ambassis* (Lacépède), as used in "Fishes of Oceania." Weber and Beaufort unite *Ambassis batjaensis* Bleeker with this species.

Ambassis gymnocephalus (Lacépède).

Lutjanus gymnocephalus Lacépède: Hist. Nat. Poiss., vol. 4, pp. 181, 216, 1802 (type loc., Great Equinoxial Ocean [=Indo-Pacific]).

Ambassis gymnocephalus Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 412, 1929 (Waigiu).

Ambassis dussumierii Schmeltz: Mus. Godeffroy, Cat. 3, p. 7, 1866 (Samoa).

Also the above name replaces *Ambassis dussumieri* Cuvier as used in "Fishes of Oceania."

Ambassis miops Günther.

Ambassis miops Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 408, 1929 (Fate River, North New Guinea).

Ambassis agrammus Günther.*

Ambassis agrammus Günther: Ann. Mag. Nat. Hist. London, series 3, vol. 20, p. 57, 1867 (type loc., Cape York, Australia).—Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 411, 1929 (British New Guinea).

Ambassis buton Popta.*

Ambassis buton Popta: Zool. Mus. Leiden, Meded., p. 6, 1918 (type loc., Buton, New Guinea).—Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 411, 1929 (Buton and Sermowai River, New Guinea).

Ambassis reticulata Weber.*

Ambassis interrupta var. *reticulata* Weber: Nova Guinea, vol. 9, pt. 4, p. 574, 1913 (type loc., Merauke; Bivak Island, Sabang, Alkmaar, Rivierkamp, Verlaten Bocht, New Guinea).

Ambassis reticulata Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 414, fig. 98, 1929 (Merauke, Lorentz River, Setakwa River).

This species may be separated from *Ambassis interrupta,* with which it was united in my "Fishes of Oceania."

Ambassis interrupta Bleeker.

Ambassis interrupta Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 415, 1929 (Siko and Sermowai River, New Guinea).

Ambassis urotaenia Bleeker.

Ambassis urotaenia Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 404, 1929 (Waigiu).

Ambassis gigas Ramsay and Ogilby.

Ambassis gigas Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 404, 1929 (Strickland, Upper Digul and Lorentz Rivers, New Guinea).

Ambassis confinis Weber.

Ambassis confinis Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 419, 1929 (Kaiserin Augusta River, New Guinea).

Ambassis occidentalis Weber and Beaufort: op. cit., vol. 5, p. 420, 1929 (type loc., river near Njao; Sermowai River and Pioniersbivak on Mamberamo River, New Guinea).

DULEIDAE (=KUHLIIDAE)

Dules rupestris (Lacépède).

Dules rupestris Schmeltz: Mus. Godeffroy, Cat. 3, p. 7, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 39, 1879 (Viti Levu and Upolu).—Pöhl: op. cit., 9, p. 27, 1884 (Viti and Upolu).

Kuhlia rupestris Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).—Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 270, 1929 (Stephansort, New Guinea).

One of 150 mm. from Fife Bay, Papua, in the Queensland Museum.

Dules marginatus Cuvier.

Dules marginatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 39, 1879 (Tahiti).—Pöhl: op. cit., 9, p. 27, 1884 (Tahiti).

Kuhlia marginata Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, January-March, 1928 (Santa Cruz Islands).—Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 271, 1929 (Mbai and Klipong Rivers, New Guinea).

Dules malo Schmeltz: Mus. Godeffroy, Cat. 2, p. 6, 1865 (Neva River, Viti Levu).—Schmeltz: op. cit., 3, p. 7, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 39, 1879 (Viti Levu).—Pöhl: op. cit., 9, p. 27, 1884 (Viti).

Dules munda (De Vis).

Kuhlia munda Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 274, 1929 (Port Moresby, New Guinea; New Caledonia).

Dules sandvicensis (Steindachner).

Depth 2 2/3; head 3 1/3, width 2; snout 4 1/8 in head from snout tip; eye 2 7/8, greater than snout or interorbital; maxillary reaches 1/5 in eye, expansion 3 1/8 in eye diameter, length 2 3/4 in head from snout tip; teeth in villiform bands in jaws, on vomer and palatines; interorbital 3 1/2, level; preopercle edge serrate, serrae little larger around angle. Gill rakers 11+29, lanceolate, slender; gill filaments 3/5 of gill rakers, which 1/2 of eye.

Scales 50 in lateral line to caudal base and 5 more on latter; 6 above, 11 below, 14 predorsal; 3 rows on cheek to preopercle ridge. Dorsals and anals with scaly basal sheaths. Scales with 15 basal radiating striae; apical denticles 64, with 15 transverse series of basal elements; circuli very fine.

D. X, 11, 1, fourth spine, 1 2/5 in total head length, first ray 1 4/5; A. III, 11, 1, third spine 2 1/8, first ray 1 7/8; least depth of caudal peduncle 2 1/3; pectoral 1 2/5; ventral 1 3/5; caudal 2 7/8 in combined head and body to caudal base, deeply forked, upper lobe longer.

Back sepia, with neutral-gray tints. Sides below and under surface silvery-white. Iris pearl-white, with neutral-gray shades above. End of snout and mandible dusky. Vertical fins pale-gray, with neutral-dusky to slate marginally, most distinct at summit of soft dorsal and anal lobes and around entire caudal edge. Paired fins cream-buff. Pectoral little gray terminally, and ventral white terminally. Length 190 mm. Honolulu. R. W. Wehrle.

Common in Honolulu markets March 29, 30, 31, April 1, 2.

Dules mutabunda (Kendall and Radcliffe).

Kuhlia mutabunda Rendahl: Nat. Hist. Juan Fernandez and Easter Island, Skottsberg, vol. 3, Zool. pt. 1, p. 63, 1921 (Easter Island).

Dules taeniurus Cuvier.

Dules argenteus Pöhl: Mus. Godeffroy, Cat. 9, p. 27, 1884 (Bonham Island).

SERRANIDAE [4]

Percalates colonorum Günther.

Reported by Whitley: Pan-Pacific Inst., Jour., vol. 1, no. 2, p. 5, January-March, 1927 (Fiji "introduced from Australia").

Lates calcarifer (Bloch).

Lates calcarifer Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 396, fig. 96, 1929 (Lorentz River, New Guinea).

Psammoperca waigiensis (Cuvier).

Psammoperca waigiensis Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 394, fig. 95, 1929 (Waigiu; Gulf of Papua, New Guinea).

Acanthistius fuscus Regan.

Acanthistius fuscus Rendahl: Nat. Hist. Juan Fernandez and Easter Island, Skottsberg, vol. 3, Zool. pt. 1, p. 63, 1921 (Easter Island).

Trachypoma macracanthus Günther.

Trachypoma macracanthus Rendahl: op. cit., vol. 3, Zool. pt. 1, p. 63, 1921 (Easter Island).

Centrogenys vaigiensis (Quoy and Gaimard).

Myriodon waigiensis Schmeltz: Mus. Godeffroy, Cat. 1, p. 8, 1864 (South Seas).

Plectropomus maculatus (Bloch).

Two specimens, 288 and 310 mm. long, from Mrs. C. A. McFarlane, obtained at Mortlock Island. These are the fine-spotted form-figured by Bleeker as pl. 13, fig. 3.

Plectropomus Oken 1817 supersedes *Paracanthistius* Bleeker, 1874, as used in "Fishes of Oceania."

Variola louti (Forskal).

Serranus louti Schmeltz: Mus. Godeffroy, Cat. 7, p. 37, 1879 (Tahiti).—Pöhl: op. cit., 9, p. 26, 1884 (Tahiti).

One specimen, 305 mm. long, in the Queensland Museum from San Cristoval.

Cephalopholis pachycentron (Valenciennes).

Four, 146 to 167 mm., in the Queensland Museum, obtained in the Solomon Islands, by Mr. A. R. Spencer.

Cephalopholis argus Schneider.

Cephalopholis argus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Serranus myriaster Schmeltz: Mus. Godeffroy, Cat. 1, p. 7, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 6, 1865 (Samoa).

Osphronemus trichopterus Günther has been reported by Pöhl: Mus. Godeffroy, Cat. 9, p. 35, 1884 (South Seas), likely an introduction.

Serranus guttatus Schmeltz: op. cit., 3, p. 7, 1864 (Samoa).—Schmeltz: op. cit., 7, p. 37, 1879 (South Seas).—Pöhl: op. cit., 9, p. 25, 1884 (South Seas).

In the Queensland Museum No. 497 type of *Serranus perguttatus* De Vis. New Hebrides. Dr. Cheelse. Length 213 mm.

Cephalopholis miniatus (Forskål).

Serranus miniatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 37, 1879 (Savaii).—Pöhl: op. cit., 9, p. 25, 1884 (Savaii).

One 248 mm. long from Mortlock Island, obtained by Mrs. McFarlane, in the Queensland Museum.

Cephalopholis urodelus (Schneider).

Serranus urodelus Schmeltz: Mus. Godeffroy, Cat. 3, p. 7, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 37, 1879 (South Sea Islands).—Pöhl: op. cit., 9, p. 25, 1884 (South Sea).

Cephalophalis urodelus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Cephalopholis leopardus (Lacépède).

Serranus leopardus Schmeltz: Mus. Godeffroy, Cat. 7, p. 37, 1879 (South Sea Islands).—Pöhl: op. cit., 9, p. 25, 1884 (New Britain).

Serranus fasciatus (Forskål).

Serranus fasciatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 37, 1879 (Tahiti).—Pöhl: op. cit., 9, p. 25, 1884 (Tahiti).

Serranus maculatus (Bloch).

Epinephelus maculatus Jordan: Pan-Pacific Inst., Jour., vol. 2, no. 4, p. 6, October-December, 1927 (Samoa).—Whitley: op. cit., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Serranus sebae Schmeltz: Mus. Godeffroy, Cat. 2, p. 5, 1865 (South Seas).

Serranus trimaculatus Valenciennes.

Serranus ura Schmeltz: Mus. Godeffroy, Cat. 7, p. 37, 1879 (South Sea Islands).—Pöhl: op. cit., 9, p. 25, 1884 (South Seas).

Serranus quernus (Seale).

One adult and three half-grown in Honolulu markets, March 30.

Serranus corallicola Valenciennes.

Serranus corallicola Pöhl: Mus. Godeffroy, Cat. 9, p. 25, 1884 (Howland Island).

Serranus altiveliaides Schmeltz: op. cit., 8, p. 5, 1881 (Ponape).—Pöhl: op. cit., 9, p. 26, 1884 (Ponape).

Serranus nebulosus Valenciennes.

Serranus moara Schmeltz: Mus. Godeffroy, Cat. 7, p. 37, 1879 (Pelew Islands).

Serranus merra (Bloch).

Serranus merra Schmeltz: Mus. Godeffroy, Cat. 3, p. 7, 1866 (Samoa).

Epinephelus merra Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Serranus faveatus Schmeltz: op. cit., 1, p. 7, 1864 (South Seas).

Serranus hexagonatus Schmeltz: op. cit., 2, p. 5, 1865 (Samoa).

Serranus hexagonatus var. *col* [*colonus?*] Schmeltz: op. cit., 2, p. 6, 1865 (Samoa).—Schmeltz: op. cit., 3, p. 7, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 37, 1879 (South Sea Islands).—Pöhl: op. cit., 9, p. 25, 1884 (South Seas).

Epinephelus stellans Jordan: Pan-Pacific Inst., Jour., vol. 2, no. 4, p. 6, October-December, 1927 (Samoa; evident lapsus for *stellatus*).

One 150 mm. from the Solomon Islands, obtained by Mr. A. R. Spencer, in the Queensland Museum. One in the Bishop Museum, 98 mm. long, obtained by Dr. H. L. Ladd at Suva, Fiji, in 1926.

Serranus socialis Günther.

Serranus socialis Schmeltz: Mus. Godeffroy, Cat. 7, p. 37, 1879 (Paumotu Islands).—Pöhl: op. cit., 9, p. 25, 1884 (Paumotu).

Ephinephelus socialis Jordan: Pan-Pacific Inst., Jour., vol. 2, no. 4, p. 6, 1927 (Samoa).

Serranus tauvina (Forskål).

Serranus salmonoides Schmeltz: Mus. Godeffroy, Cat. 2, p. 6, 1865 (Samoa).—Schmeltz: op. cit., 7, p. 37, 1879 (Upolu).—Pöhl: op. cit., 9, p. 25, 1884 (South Seas).

Serranus crapao Schmeltz: op. cit., 7, p. 37, 1879 (Viti Islands).

Serranus malabaricus (Schneider).*

Holocentrus malabaricus Schneider: Syst. Ichth. Bloch, p. 319, pl. 63, 1801 (type loc., Tranquebar).

Serranus suillus Schmeltz: Mus. Godeffroy, Cat. 8, p. 5, 1881 (Ponape).—Pöhl: op. cit., 9, p. 26, 1884 (Ponape).

Epinephelus pantherinus Whitley: Pan-Pacific Inst., Jour., vol. 1, no. 2, p. 5, January-March, 1927 (Fiji).

Serranus caeruleo-punctatus (Bloch).

Serranus haevenii Schmeltz: Mus. Godeffroy, Cat. 7, p. 37, 1879 (Viti Islands).—Pöhl: op. cit., 9, p. 25, 1884 (Viti).

Serranus summana (Forskål).

Serranus summana Pöhl: Mus. Godeffroy, Cat. 9, p. 37, 1879 (Viti Islands).

Serranus fuscoguttatus (Forskål).

Epinephelus fuscoguttatus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Serranus lanceolatus (Bloch).

Promicrops lanceolatus Whitley: Pan-Pacific Inst., Jour., vol. 1, no. 2, p. 5, January-March, 1927 (Fiji).

Anyperodon leucogrammicus (Valenciennes).

Anyperodon leucogrammicus Pöhl: Mus. Godeffroy, Cat. 9, p. 25, 1884 (Ponape).

Odontanthias fuscipinnis (Jenkins).

One in Bishop Museum, 203 mm. long, from Kau, Hawaii, obtained by Mr. W. G. Anderson.

Grammistes sexlineatus (Thunberg).

Grammistes orientalis Schmeltz: Mus. Godeffroy, Cat. 7, p. 37, 1879 (South Sea Islands).—Pöhl: op. cit., 9, p. 26, 1884 (New Britain).

Plesiops nigricans (Rüppell).

Plesiops nigricans Schmeltz: Mus. Godeffroy, Cat. 1, p. 8, 1864 (South Sea).—Schmeltz: op. cit., 3, p. 10, 1866 (Samoa).—Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 375, 1929 (Waigiu; Doreh, New Guinea).

Plesiops corallicola Schmeltz: op. cit., 1, p. 8, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 6, 1865 (South Seas).—Schmeltz: op. cit., 3, p. 10, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 50, 1879 (Samoa).—Pöhl: op. cit., 9, p. 27, 1884 (Samoa).

Plesiops caeruleo-lineatus Schmeltz: op. cit., 3, p. 10, 1866 (Samoa).

One in the Queensland Museum, 125 mm. long, obtained at Santa Anna.

Plesiops melas Bleeker.*

Plesiops melas Bleeker: Verhadel. Batav. Genootschaap (Bali), vol. 22, p. 9, 1849 (type loc., Boleling, northern Bali).—Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 378, 1929 (Waigiu; west New Guinea).

Weber and Beaufort separate this species chiefly on the absence of the opercular ocellus and head and body without dots. The references under *Plesiops melas* and *Plesiops nigricans* var. *apoda* in the "Fishes of Oceania" will then be included with the present species.

Mr. Whitley calls my attention to *Paraplesiops bleekeri* (Günther) and that it is a Sydney species, probably not occurring in Oceania. It should therefore be omitted from my "Fishes of Oceania."

PSEUDOPLESIOPIDAE

Pseudoplesiops typus Bleeker.

Pseudoplesiops typus Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 381, fig. 92, 1929 (Doreh).

Pseudochromis purpurescens (De Vis).

Type of *Nesiotes purpurescens* De Vis in the Queensland Museum, no. 1351. South Sea Islands. Captain Eastlake. Length 63 mm.

Nesiotes De Vis cannot be retained as a genus distinct from *Pseudochromis*.

Pseudochromis fuscus Müller and Troschel.

Pseudochromis fuscus Schmeltz: Mus. Godeffroy, Cat. 7, p. 44, 1879 (Boston Island).—Pöhl: op. cit., 10, p. 32, 1884 (Boston Island).

PRIACANTHIDAE

Priacanthus boops (Schneider).

Priacanthus boops Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 633, 1929 (1930) (Honolulu).

Two adults, 610 mm. long, in Honolulu markets, March 30.

Priacanthus cruentatus (Lacépède).

Priacanthus cruentatus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 633, 1929 (1930) (Hawaiian Islands and Honolulu).

Priacanthus carolinus Schmeltz: Mus. Godeffroy, Cat. 7, p. 38, 1879 (Tahiti).—Pöhl: op. cit., 9, p. 26, 1884 (Tahiti).

Ten adults, in the markets at Honolulu, March 30, and three July 19. Several in the market at Suva, Fiji, July 11.

Priacanthus macracanthus Cuvier.

Priacanthus macracanthus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 633, 1929 (1930) (Honolulu).

Priacanthus hamrur (Forskål).

Priacanthus hamrur Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 5, p. 384, fig. 93, 1929 (New Guinea).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 633, 1929 (1930) (Honolulu, and Shortland Island).

PEMPHERIDAE

Pempheris otaitensis Lesson.

Pempheris otaitensis Schmeltz: Mus. Godeffroy, Cat. 7, p. 46, 1879 (Tahiti).—Pöhl: op. cit., 10, p. 30, 1884 (South Seas).

Pempheris oualensis Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 633, 1929 (1930) (Apia, Samoa).

Pempheris mangula Cuvier.

Pempheris mangula Schmeltz: Mus. Godeffroy, Cat. 7, p. 46, 1879 (Huahine, Society Islands).—Pöhl: op. cit., 9, p. 30, 1884 (Huahine).

Pempheris vanicolensis Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

LOBOTIDAE

Lobotes surinamensis (Bloch).

Lobotes auctorum Pöhl: Mus. Godeffroy, Cat. 9, p. 27, 1884 (New Britain).

LUTJANIDAE

Apsilus zonatus (Valenciennes).

Apsilus zonatus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 634, 1929 (1930) (Honolulu).

Half-grown example in Honolulu market, April 1.

Pristipomoides microlepis (Bleeker).

Pristipomoides microlepis Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 634, 1929 (1930) (Hawaii).

Ten adults in Honolulu markets, March 31.

Pristipomoides sieboldii (Bleeker).

Pristipomoides sieboldii Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 634, 1929 (1930) (Honolulu).

Thirty adults in Honolulu markets, March 30, three March 31, two April 1, three April 2.

Pristipomoides microdon (Steindachner).

Pristipomoides microdon Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 634, 1929 (1930) (Honolulu).

I find by a re-examination of materials in the Academy identified by me as *Pristipomoides sieboldii*, that they belong with the present species. All were obtained in the markets of Honolulu. This species was described subsequently as *Bowersia violescens* Jordan and Evermann, though included wrongly with Bleeker's species in my "Fishes of Oceania."

Aprion virescens Valenciennes.

Aprion virescens Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 634, 1929 (1930) (Honolulu).

Pentapus latifrons Whitley: Pan-Pacific Inst., Jour., vol. 1, no. 2, p. 5, January-March, 1927 (Fiji).

Twenty adults in Honolulu markets, March 30, ten April 2.

Etelis carbunculus Cuvier.

Etelis carbunculus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 634, 1929 (1930) (Honolulu).

Common in Honolulu markets, March 30, 31, April 1, 2, and 3.

Etelis marshi (Jenkins).

Etelis marshi Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 634, 1929 (1930) (Honolulu).

Fifteen adults in Honolulu markets, March 30, one of which yellow on back and on dorsal fins. Also one yellow, and twenty red, March 31. Five, all red, April 1, three April 2, two July 19.

Aphareus furcatus (Lacépède).

Aphareus furcatus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 635, 1929 (1930) (Honolulu).

Lutjanus kasmira (Forskål).

Lutjanus kasmira Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 635, 1929 (1930) (Marcus Island, Tahiti, Mangareva, Nukuhiva).

Diacope notata Schmeltz: Mus. Godeffroy, Cat. 1, p. 7, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 6, 1865 (South Seas).

Genyoroge notata Schmeltz: op. cit., 3, p. 7, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 37, 1879 (South Sea Islands).—Pöhl: op. cit., 9, p. 26, 1884 (South Seas).

Diacope octolineata Schmeltz: op. cit., 2, p. 6, 1865 (Samoa).

Genyoroge bengalensis Schmeltz: op. cit., 3, p. 7, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 37, 1879 (South Sea Islands).—Pöhl: op. cit., 9, p. 26, 1884 (South Seas).

One example, 166 mm., from Solomon Islands, obtained by Mr. A. R. Spencer, in the Queensland Museum.

Lutjanus vitta (Quoy and Gaimard).

Lutjanus vitta Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Lutjanus biguttatus (Valenciennes).

Mesoprion bleekeri Schmeltz: Mus. Godeffroy, Cat. 7, p. 38, 1879 (Samoa Islands).—Schmeltz: op. cit., 8, p. 5, 1881 (Samoa Islands).—Pöhl: op. cit., 9, p. 26, 1884 (Samoa Islands).

Lutjanus semicinctus Quoy and Gaimard.

Mesoprion semicinctus Schmeltz: Mus. Godeffroy, Cat. 1, p. 7, 1864 (South Seas).—Pöhl: op. cit., 9, p. 26, 1884 (South Seas).

Lutjanus semicinctus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Lutjanus bohar (Forskål).

Lutjanus bohar Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 636, 1929 (1930) (Thornton, Marcus, and Shortland Islands).

Mesoprion bohar Schmeltz: Mus. Godeffroy, Cat. 8, p. 5, 1881 (Upolu).—Pöhl: op. cit., 9, p. 26, 1884 (Upolu).

Type of *Mesoprion flaviroseus* De Vis. No. 101, Queensland Museum. New Britain. Length 75 mm..

Lutjanus fulviflamma (Forskål).

Mesoprion fulviflamma Schmeltz: Mus. Godeffroy, Cat. 7, p. 38, 1879 (Kandavu, Savaii).—Pöhl: op. cit., 9, p. 26, 1884 (Kandavu).

Lutjanus fulviflamma Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 636, 1929 (1930) (Shortland Island).

Lutjanus flavipes (Valenciennes).

Lutjanus flavipes Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Lutjanus vaigiensis (Quoy and Gaimard).

Lutjanus vaigiensis Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 636, 1929 (1930) (Thornton, Palmyra, Guam, Faté, Shortland Island).

Genyoroge marginata Schmeltz: Mus. Godeffroy, Cat. 2, p. 6, 1865 (Samoa).—Schmeltz: op. cit., 7, p. 37, 1879 (South Sea Islands; Samoa).—Pöhl: op. cit., 9, p. 26, 1884 (South Seas).

Lutjanus marginatus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

As may be inferred from these references *Lutjanus marginatus* of my "Fishes of Oceania" is synonymous with this species.

Lutjanus gibbus (Forskål).

Genyoroge gibba Schmeltz: Mus. Godeffroy, Cat. 7, p. 37, 1879 (Tahiti).

Mesoprion gibbus Pöhl: op. cit., 9, p. 26, 1884 (Tahiti).

Lutjanus gibbus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 636, 1929 (1930) (Apia, Faté, Tahiti).

Genyoroge bottonensis Schmeltz: op. cit., 3, p. 7, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 38, 1879 (South Sea Islands).

Genyoroge bostonensis Pöhl: op. cit., 9, p. 26, 1884 (South Seas). (Misprint for *bottonensis*.)

Large red example seen in the market at Suva, Fiji, July 11.

Lutjanus caudalis (Valenciennes).

Lutjanus caudalis Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1925 (Santa Cruz Islands).

Lutjanus monostigma (Cuvier).

Mesoprion monostigma Pöhl: Mus. Godeffroy, Cat. 9, p. 26, 1884 (Mortlock Island).

Lutjanus monostigma Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 636, 1929 (1930) (Palmyra, Rarotonga, Faté, Shortland Island).

Lutjanus argentimaculatus (Forskål).

Mesoprion gembra Schmeltz: Mus. Godeffroy, Cat. 7, p. 38, 1879 (Tonga [Palau], and Samoa Islands).—Pöhl: op. cit., 9, p. 26, 1884 (Pelew Islands).

?*Mesoprion griseus* (non Linné) Schmeltz: op. cit., 8, p. 5, 1881 (Ponape).—Pöhl: op. cit., 9, p. 26, 1884 (Ponape).

Lutjanus ehrenbergii (Peters).*

Mesoprion ehrenbergii Peters: Akad. Wissensch. Berlin, Monatsber., p. 704, 1869 (type loc., Red Sea).

Lutjanus ehrenbergii Pöhl: Mus. Godeffroy, Cat. 9, p. 26, 1884 (Mortlock Island).

Lutjanus niger (Forskål).

Genyoroge macolor Schmeltz: Mus. Godeffroy, Cat. 7, p. 37, 1879 (Viti and Palau Islands).—Pöhl: op. cit., 9, p. 26, 1884 (Pelew Islands).

POMADASIDAE

Caesio pisang Bleeker.

Caesio pisang Pöhl: Mus. Godeffroy, Cat. 9, p. 29, 1884 (Mortlock Island).

Caesio maculatus Cuvier.

Caesio maculatus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Caesio lunaris Cuvier.

Caesio lunaris Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 638, 1929 (1930) (Shortland Island).

Caesio caerulaureus Lacépède.

Caesio caerulaureus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 638, 1929 (1930) (Shortland Island).

Caesio tile Cuvier.

Caesio tile Pöhl: Mus. Godeffroy, Cat. 9, p. 29, 1884 (Mortlock Island).

Caesio cylindricus Günther.*

Caesio cylindricus Günther: Cat. Fishes Brit. Mus., vol. 1, p. 393, 1859 (type loc., Madagascar).—Schmeltz: Mus. Godeffroy, Cat. 7, p. 40, 1879 (Tahiti).—Pöhl: op. cit., 9, p. 29, 1884 (Tahiti).

Plectorhinchus nigrus (Cuvier).

Pristipoma nigrum (Mertens) Cuvier: Hist. Nat. Poiss., vol. 5, p. 192, 1830 (type loc., Manilla).

Plectorhinchus affine Schmeltz: Mus. Godeffroy, Cat. 3, p. 7, 1866 (Samoa).—Schmeltz: op. cit., vol. 7, p. 39, 1879 (Samoan Islands).

The above name has priority over *Diagramma crassispinum* Rüppell as used in my "Fishes of Oceania."

Plectorhinchus diagramma (Linné).

Diagramma lessonii Schmeltz: Mus. Godeffroy, Cat. 3, p. 7, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 39, 1879 (Samoan Islands).—Pöhl: op. cit., 9, p. 27, 1884 (Samoa).

Plectorhinchus schotaf (Forskål).

Diagramma giganteum Schmeltz: Mus. Godeffroy, Cat. 8, p. 5, 1881 (Ponape).

Euelatichthys obscurus Whitley: Pan-Pacific Inst., Jour., vol. 1, no. 2, p. 5, January-March, 1927 (Fiji).

One seen in the market at Suva, Fiji, July 12.

Plectorhinchus pictus (Thunberg).

Plectorhynchus picta Whitley: Pan-Pacific Inst., Jour., vol. 1, no. 2, p. 5, January-March, 1927 (Fiji: probably Günther's reference to Ovalau in 1880 intended).

Plectorhinchus punctatus Whitley: op. cit., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Scolopsis trilineatus Kner.

Scolopsis triliniatus Pöhl: Mus. Godeffroy, Cat. 9, p. 27, 1884 (Savaii).

Scolopsis trilineatus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 641, 1929 (1930) (Apia, Samoa and Faté).

Scolopsis cancellatus (Cuvier).

Scolopsis cancellata Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Scolopsis cancellatus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 641, 1929 (1930) (Faté and Agaña, Guam).

Scolopsis ciliatus (Lacépède).

Scolopsis ciliata Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Scolopsis bilineatus (Bloch).

Scolopsis bilineatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 39, 1879 (Viti Islands).—Pöhl: op. cit., 9, p. 27, 1884 (Viti).

Scolopsis monogramma (Cuvier).

Scolopsis monogramma Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 641, 1929 (1930) (Faté).

Scolopsis ghanam (Forskål).

Scolopsis ghanam Schmeltz: Mus. Godeffroy, Cat. 7, p. 40, 1870 (Savaii).—Pöhl: op. cit., 9, p. 27, 1884 (Savaii).

Scolopsis temporalis (Cuvier).

Scolopsis temporalis Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

TERAPONIDAE

Terapon theraps Cuvier.

Therapon cinereus Schmeltz: Mus. Godeffroy, Cat. 3, p. 7, 1866 (Samoa).

Terapon puta Cuvier.

Therapon trivittatus Schmeltz: Mus. Godeffroy, Cat. 1, p. 8, 1864 (South Seas).

Terapon jarbua (Forskål).

Therapon servus Schmeltz: Mus. Godeffroy, Cat. 1, p. 8, 1864 (South Seas).—Schmeltz: op. cit., 3, p. 7, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 39, 1879 (South Seas).

Two were seen in the market at Suva, Fiji, July 12.

Terapon unicolor Günther.

Therapon unicolor Whitley: Pan-Pacific Inst., Jour., vol. 1, no. 2, p. 5, January-March, 1927 (Fiji).

Terapon argenteus (Cuvier).

Therapon argenteus Whitley: Pan-Pacific Inst., Jour., vol. 1, no. 2, p. 5, January-March, 1927 (Fiji).

Pelates sexlineatus (Quoy and Gaimard).

Therapon cuvieri Schmeltz: Mus. Godeffroy, Cat. 7, p. 39, 1879 (Viti Islands).

Therapon cuvierii Pöhl: op. cit., 9, p. 27, 1884 (Viti).

Pelates quadrilineatus (Bloch).*

Holocentrus quadrilineatus Bloch: Naturgesch. ausland. Fische, vol. 4, p. 80, pl. 238, fig. 2, 1790 (type loc., "aus dem Orient").

Pelates quadrilineatus Whitley: Pan-Pacific Inst., Jour., vol. 1, no. 2, p. 5, January-March, 1927 (Fiji).

LETHRINIDAE

Lethrinus mahsena (Forskål).

Lethrinus masena Pöhl: Mus. Godeffroy, Cat. 9, p. 29, 1884 (South Seas).

Lethrinus reticulatus Valenciennes.

Lethrinus reticulatus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 642, 1929 (1930) (Guam).

Lethrinus moensii Pöhl: Mus. Godeffroy, Cat. 9, p. 29, 1884 (Pelew [Palau] Islands).

Lethrinus mahsenoides Valenciennes.

Lethrinus mashenoides Schmeltz: Mus. Godeffroy, Cat. 1, p. 8, 1864 (Viti-Levu). (Misprint.)

Lethrinus mahsenoides Schmeltz: op. cit., 3, p. 7, 1866 (Viti Levu).

Lethrinus ramak (Forskål).

Lethrinus ramak Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 642, 1929 (1930) (Apia).

Lethrinus harak (Forskål).

Lethrinus harak Schmeltz: Mus. Godeffroy, Cat. 7, p. 40, 1879 (Viti Islands).—Pöhl: op. cit., 9, p. 29, 1884 (South Seas).

Lethrinus bomhanensis Pöhl: op. cit., 9, p. 29, 1884 (Tonga).

Lethrinus leutjanus (Lacépède).

Lethrinus leutjanus Schmeltz: Mus. Godeffroy, Cat. 1, p. 8, 1864 (South Seas).

Lethrinus nebulosus (Forskål).

Lethrinus nebulosus Schmeltz: Mus. Godeffroy, Cat. 7, p. 40, 1879 (Samoa).

Four seen in the market at Suva, Fiji, July 12.

Lethrinus miniatus (Schneider).

Lethrinus miniatus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 642, 1929 (1930) (Nukuhiva).

Pentapodus vitta Quoy and Gaimard.

Replaces *Pentapus vitta.*

Pentapodus trivittatus (Bloch).

Pentapodus trivittatus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 642, 1929 (1930) (Shortland Island).

Pentapodus aurolineatus (Lacépède).

Pentapus aurolineatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 40, 1879 (Samoa and Tahiti).—Pöhl: op. cit., 9, p. 29, 1884 (Samoa).

Pentapodus aurolineatus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 642, 1929 (1930) (Nukuhiva and Mangareva).

In the Queensland Museum, one specimen, 113 mm. long, from the Solomon Islands, obtained by Mr. A. R. Spencer. *Pentapodus* is the oldest name available for this genus and replaces *Pentapus* as used in my "Fishes of Oceania."

Pentapodus caninus (Cuvier).

Heterognathodon caninus Pöhl: Mus. Godeffroy, Cat. 9, p. 29, 1884 (Bonham Island).

Heterognathodon bifasciatus Schmeltz: op. cit., 7, p. 40, 1879 (Pelew [Palau] Islands).

Pentapodus xanthopleura (Bleeker).*

Heterognathodon xanthopleura Bleeker: Naturk. Tijds. Nederl. Indie, vol. 1, p. 101, 1850 (type loc., Batavia, Java).—Schmeltz: Mus. Godeffroy, Cat. 2, p. 6, 1865 (Samoa).—Schmeltz: op. cit., 7, p. 40, 1879 (Samoa Islands).

In the Queensland Museum, one, 180 mm. long, from the Solomons, obtained by Mr. A. R. Spencer.

Pentapodus nemurus (Bleeker).

Replaces *Pentapus nemurus.*

Pentapodus hellmuthii (Bleeker).

Replaces *Pentapus hellmuthii.*

SPARIDAE

Pagrosomus auratus (Schneider).

Labrus aurata Schneider: Syst. Ichth. Bloch, p. 266, 1801 (type loc., New Zealand).

Pagrosomus auratus Fowler: Acad. Nat. Sci., Philadelphia, Proc., p. 644, 1929 (1930) (Hawaiian Islands).

Pagrus unicolor Schmeltz: Mus. Godeffroy, Cat. 1, p. 8, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 6, 1865 (South Seas).—Schmeltz: op. cit., 7, p. 40, 1879 (South Seas).—Pöhl: op. cit., 9, p. 29, 1884 (South Seas).

The reference to *Scomber auratus* Houttuyn in my "Fishes of Oceania," p. 218, is wrong. The species should have been credited as above. Jordan and Snyder have noticed (U. S. Nat. Mus., Proc., vol. 23, p. 747, 1901) that *Scomber auratus* Houttuyn is synonymous with *Scomber japonicus* Houttuyn, printed on the preceding page of the same work.

Monotaxis grandoculis (Forskål).

Sphaerodon grandoculis Schmeltz: Mus Godeffroy, Cat. 7, p. 40, 1879 (Upolu).—Pöhl: op. cit., 9, p. 29, 1884 (Upolu).

Monotaxis grandoculis Fowler: Acad. Nat. Sci., Philadelphia, Proc., p. 644, 1929 (1930) (Honolulu).

Sphaerodon cuanus Pöhl: op. cit., 9, p. 29, 1884 (Mortlock).

Dentex furcosus Valenciennes.*

Dentex furcosus Valenciennes: Hist. Nat. Poiss., vol. 6, p. 244, 1830 (type loc., Trinquemale, Ceylon).

Nemipterus marginatus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Dentex gracilis Bleeker.*

Dentex gracilis Bleeker: Konig. Akad. Wet. Amsterdam, Verhandel., series 3, vol. 13, p. 34, 1873 (type loc., Java; Nias; Celebes; Amboina).

Smaris gracilis (non Bonaparte) Pöhl: Mus. Godeffroy, Cat. 9, p. 29 1884 (Ponape).

GIRELLIDAE

Girella nebulosa Kendall and Radcliffe.

Girellops nebulosus Rendahl: Nat. Hist. Juan Fernandez and Easter Island, Skottsberg, vol. 3, Zool. pt. 1, p. 64, 1921 (Easter Island).

KYPHOSIDAE

Kyphosus cinerascens (Forskål).

Kyphosus cinerascens Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 645, 1929 (1930) (Shortland Island).

Pimelepterus tahmel Schmeltz: Mus. Godeffroy, Cat. 8, p. 28, 1881 (Ponape).—Pöhl: op. cit., 9, p. 29, 1884 (Ponape).

Kyphosus lembus (Cuvier).

Kyphosus lembus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Kyphosus fuscus (Lacépède).

Pimelepterus fuscus Pöhl: Mus. Godeffroy, Cat. 9, p. 29, 1884 (Tahiti).

Kyphosus fuscus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 645, 1929 (1930) (Honolulu and Laie Stream; Shortland Island).

Back gray-brown, with neutral tinge. Below white. On back and sides each row of scales with narrow gray-brown longitudinal line, following in scale junctures, parallel with lateral line and much narrower above its course, in horizontal rows below, those on middle of side widest, also intervening silvery white lines equally wide. Broad gray-white band extends from front nostril over infraorbitals close to lower eye edge. Vertical fins gray-brown; dusky on spinous dorsal and submarginal dusky band on soft dorsal. Pectoral pale. Ventral gray-brown, inner faces whitish basally. Iris pale-buff. Length 119 mm. Honolulu. R. W. Wehrle.

Two adults in Honolulu markets, March 30.

Kyphosus vaigiensis (Quoy and Gaimard).

Pimelepterus waigiensis Pöhl: Mus. Godeffroy, Cat. 9, p. 29, 1884 (Ponape).

EMMELICHTHYIDAE (=ERYTHRICHTHYIDAE)

Erythrocles schlegelii (Günther).

Erythroeles schlegelii Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 646, 1929 (1930) (Honolulu).

Three in Honolulu markets, March 30, one April 1. *Erythrocles* supersedes *Erythrichthys* as used in my "Fishes of Oceania."

GERRIDAE

"*Gerres amboinensis* Bleeker," as reported by Schmeltz (Mus. Godeffroy, Cat. 7, p. 55, 1870, Upolu), I have not located.

Gerres argyreus (Schneider).

Gerres argyreus Schmeltz: Mus. Godeffroy Cat. 2, p. 6, 1865 (Samoa).—Schmeltz: op. cit., 3, p. 7, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 55, 1879 (Samoa).—Pöhl: op. cit., 9, p. 28, 1884 (Samoa).—Whitley: Pan-Pacific Inst., Jour., vol 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Gerres kapas Bleeker.

Gerres kapas Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 647, 1929 (1930) (Samoa).

Gerres oyena (Forskål).

Gerres oyena Schmeltz: Mus. Godeffroy, Cat. 7, p. 55, 1879 (Vavau).—Pöhl: op. cit., 9, p. 28, 1884 (Vavau).

?Gerres rhombeus (non Cuvier) Schmeltz: op. cit., 8, p. 28, 1884 (Samoa).

Gerres gigas Günther.

Gerres macrosoma (non Bleeker) Schmeltz: Mus. Godeffroy, Cat. 7, p. 55, 1879 (Savaii).

Gerres filamentosus Cuvier.

Gerres maeracanthus Schmeltz: Mus. Godeffroy, Cat. 8, p. 7, 1881 (Ponape).—Pöhl: op. cit., 9, p. 28, 1884 (Ponape).

Gerres punctatus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

MULLIDAE

Upeneoides vittatus (Forskål).

Upeneoides vittatus Schmeltz: Mus. Godeffroy, Cat. 2, p. 6, 1865 (Samoa).—Schmeltz: op. cit., 3, p. 7, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 40, 1879 (South Sea Islands).—Pöhl: op. cit., 9, p, 1884 (Samoa), p. 45 (New Guinea).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 647, 1929 (1930) (Tahiti).

In the Queensland Museum, three specimens, 168 to 200 mm., from Papua.

Upeneoides arge (Jordan and Evermann).

Upeneoides arge Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 648, 1929 (1930) (Honolulu).

Common in Honolulu markets, March 30, 31, April 1, 2, July 19.

Upeneichthys porosus (Cuvier).

Upeneichthys porosus Schmeltz: Mus. Godeffroy, Cat. 2, p. 6, 1865 (Samoa).

Upeneiehtys porosus Schmeltz: op. cit., 3, p. 7, 1866 (Samoa). (Misprint.)

Upeneus bifasciatus (Lacépède).

Upeneus bifasciatus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 648, 1929 (1930) (Honolulu and Apia).

Upeneus porphyreus (Jenkins).

Upeneus porphyreus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 648, 1929 (1930) (Honolulu).

In Honolulu markets, 5 March 30, 6 March 31, 3 July 19.

Upeneus multifasciatus (Quoy and Gaimard).

Upeneus multifasciatus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 648, 1929 (1930) (Honolulu; Tahiti; Pacific Ocean).

Generally geranium-pink, each scale on body with median or basal carmine blotch. Between dorsals and anals and at caudal base scarlet tints. Iris carmine, with neutral-gray tinge. Front with salmon and pale-brown tints. Barbels wine-purple basally, maize-yellow terminally. Some dusky-olive cloudings or blotches on postocular, shoulder girdle and predorsal. Spinous dorsal geranium-pink basally, terminally broadly gray, with margin all around slate-black. Obscure dusky interdorsal saddle on back. Second dorsal largely slate-black, with four horizontal or longitudinal dark-gray closely parallel lines subterminally on fin. Anal dusky-olive, basally gray and three longitudinal gray lines. Caudal orange, pale-olive terminally on lobes and edges narrowly dusky. Pectoral dull-yellow, axil deep-pink. Ventral orange-red, membranes terminally neutral-dusky, with front fin edge dark. Length 150 mm. Honolulu. R. W. Wehrle.

Common in Honolulu markets, March 30, April 1, July 19.

Upeneus trifasciatus (Lacépède).

Mullus trifaseiatus Lacépède: Hist. Nat. Poiss., vol. 3, pp. 383, 404, pl. 15, fig. 1, 1802 (no type locality).

Upeneus trifasciatus (non Lacépède) Schmeltz: Mus. Godeffroy, Cat. 3, p. 7, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 40, 1879 (Samoa).—Pöhl: op. cit., 9, p. 27, 1884 (Samoa).

Pseudupeneus moana Jordan and Seale: U. S. Bur. Fisher., Bull., vol. 25, p. 274, 1905 (1906) (type loc., Apia, Samoa).

Upeneus moana (non Quoy and Gaimard) Fowler: Bernice P. Bishop Mus., Mem., vol. 10, p. 228, 1928 (part).

Upeneus multifasciatus (non Quoy and Gaimard) Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 228, 1928 (Oceania).

A valid species, distinguished from *Upeneus multifasciatus* by the large whitish or pale area below the posterior part of the second dorsal and also behind that fin. Moreover, the first dark transverse band on the body extends down from the greater portion of the spinous dorsal base.

Upeneus barberoides Bleeker.

Upeneus atroeingulatus (Kner) Steindachner: Akad.

Wiss. Wien. Sitz., vol. 61, p. 443, 1870 (type loc., Savaii).—Schmeltz: Mus. Godeffroy, Cat. 7, p. 40, 1879 (Tonga Islands).

There is little doubt but that *Upeneus atrocingulatus* is a synonym of the present species. It is described with a whitish, underlaid, longitudinal streak from the side of the head till below the end of the first dorsal or to the second dorsal, also with a black cross band at the first dorsal.

Upeneus taeniatus Kner.

Upeneus taeniatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 40, 1879 (Viti Islands).

Upeneus chrysonemus (Jordan and Evermann).*

Pseudupeneus chrysonemus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 186, 1902 (1903) (type loc., Hilo; Honolulu).—Jenkins: op. cit., vol. 22, p. 454, 1902 (1903) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 258, pl. 21, 1903 (1905) (Honolulu; Hilo).

Upeneus chrysonemus Jordan and Jordan: Carnegie Mus., Mem., vol. 1, p. 52, Dec. 1922 (Hawaii).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 648, 1929 (1930) (Honolulu).

Upeneus taeniatus (non Kner) Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).—Fowler: Bernice P. Bishop Mus., Mem., vol. 10, p. 229, 1928 (types; Hawaii).

A valid species, known by its largely uniform coloration in preserved specimens, with dark edges to row of scales on back along each side of dorsal bases.

Upeneus macronemus (Lacépède).

Upeneus macronemus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 648, 1929 (1930) (Honolulu).

Upeneus barberinus (Lacépède).

Upeneus barberinus Schmeltz: Mus. Godeffroy, Cat. 7, p. 40, 1879 (Viti Islands).—Pöhl: op. cit., 9, p. 27, 1884 (Kandavu).

Upeneus indicus (Shaw).

Upeneus indicus Pöhl: Mus. Godeffroy, Cat. 9, p. 27, 1884 (Ponape).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 648, 1929 (1930) (Samoa).

Pseudupeneus indicus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Upeneus malabaricus Schmeltz: op. cit., 7, p. 40, 1879 (South Sea Islands).

Upeneus pleurostigma Bennett.

Upeneus pleurostigma Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 648, 1929 (1930) (Honolulu).

Abundant in Honolulu markets, March 31, April 1, July 19.

Upeneus fraterculus Valenciennes.

One 125 mm. from Guam in 1926, Lieut. H. Hornbostel. Apparently the figures of *Mullus dispilurus* Playfair and *Mullus pleurotaenia* Playfair are both the present species. My specimen agrees very largely with the former (Plate 5, fig. 3) of Playfair.

Upeneus luteus Valenciennes.

Upeneus luteus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 648, 1929 (1930) (Tahiti).

Upeneus chryserydros (Lacépède).

Upeneus chryserythrus Schmeltz: Mus. Godeffroy, Cat. 7, p. 40, 1879 (Tahiti).—Pöhl: op. cit., 9, p. 27, 1884 (Tahiti).

Upeneus chryserydros Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 648, 1929 (1930) (Honolulu).

Upeneus oxycephalus Schmeltz: op. cit., 1, p. 8, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 6, 1865 (South Seas).—Schmeltz: op. cit., 7, p. 40, 1879 (Samoa).—Pöhl: op. cit., 9, p. 27, 1884 (South Seas).

Upeneus cyclostoma Schmeltz: op. cit., 3, p. 7, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 40, 1879 (Samoa).—Schmeltz: op. cit., 9, p. 27, 1884 (Samoa).

Mulloidichthys auriflamma (Forskål).

Mulloidichthys auriflamma Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 649, 1929 (1930) (Honolulu).

Mulloides flavolineatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 40, 1879 (Savaii).—Pöhl: op. cit., 9, p. 27, 1884 (Savaii).

Common in Honolulu markets, March 30, 31, April 1, 2, July 19.

Mulloidichthys erythrinus (Klunzinger).

Mulloides ruber (non Lacépède) Schmeltz: Mus. Godeffroy, Cat. 7, p. 40, 1879 (Tahiti).—Pöhl: op. cit., 9, p. 27, 1884 (Tahiti).

Mulloidichthys vanicolensis (Cuvier).

Mulloides vanicolaris Schmeltz: Mus. Godeffroy, Cat. 1, p. 8, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 6, 1865 (South Seas).

Mulloides vanicolensis Schmeltz: op. cit., 3, p. 7, 1866 (Samoa).—Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Mulloidichthys samoensis (Günther).

Mulloides samoensis Schmeltz: Mus. Godeffroy, Cat. 7, p. 40, 1879 (Ponape).—Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Mulloidichthys samoensis Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 649, 1929 (1930) (Honolulu and Apia).

Abundant in Honolulu markets, March 30, 31, April 1.

SILLAGINIDAE [5]

Sillago sihama (Forskål).

Sillago sihama Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

MALACANTHIDAE

Malacanthus latovittatus (Lacépède).

Malacanthus latovittatus Schmeltz: Mus. Godeffroy, Cat. 8, p. 6, 1881 (Palau).—Pöhl: op. cit., 10, p. 32, 1884 (Pelew Islands).

In the Queensland Museum, one specimen, 380 mm., from the Mortlock Group, obtained by Mrs. McFarlane.

CIRRHITIDAE

Cheilodactylus vittatus Garrett.

Cheilodactylus vittatus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 656, 1929 (1930) (Honolulu).

[5] *Corvina fasciata* Tschudi is reported by Pöhl: Mus. Godeffroy, Cat. 9, p. 30, 1884 (South Seas), though this is indefinite and the species is not certainly known from Oceania.

Cirrhitoidea bimacula Jenkins (fig. 2).

Cirrhitoidea bimacula Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 656, 1929 (1930) (Honolulu).

Generally pale broccoli brown, not lighter below. Front of lips dark, like snout above. Iris rose-pink, narrow circle around pupil brighter. On trunk and tail eleven cinnamon-rufous transverse bands, variable, often broken or forking and all much wider than interspaces, last on caudal orange. On side of head behind eye two oblique cinnamon-rufous streaks, upper obliquely from suprascapula till behind maxillary and other parallel along lower cheek above preopercular ridge. Olive-black ocellus on opercle little smaller than eye and another on back partly on postero-median dorsal rays basally as well. Groove of maxillary and inner edges of lips ochre-yellow. Dorsal membranes dark or neutral-gray, cinnamon-rufous bands extending on fins basally. Anals like dorsals. Caudal cadmium yellow basally, grayish terminally. Paired fins rufous basally, ventrals neutral or blackish-slate terminally. Three from Honolulu markets, 34 to 54 mm. R. W. Wehrle.

Cirrhitus pinnulatus (Schneider).

Cirrhitus pinnulatus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 656, 1929 (1930) (Honolulu and Hawaiian Islands).

Cirrhites punctatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 42, 1879 (Savaii).—Pöhl: op. cit., 9, p. 29, 1884 (Savaii).

Cirrhites maculatus Pöhl: op. cit., 9, p. 29, 1884 (Mortlock).

Back with seven deep-brown or sepia saddles or blotches, much broader than whitish interspaces; these blotches extend down little inclined back toward median axis of body, after which series of similar though lighter intervening dark blotches along lower sides; also along above lateral line upper series of bands, more or less connected by nebulous, brown, intervening blotches; whole pattern arranged so pale interspaces emphasized as series of five or six white blotches along back, same number along close below lateral line and intervening lower sides and under surfaces with white ground color. Head variegated with brown and white, as usually deep-brown,

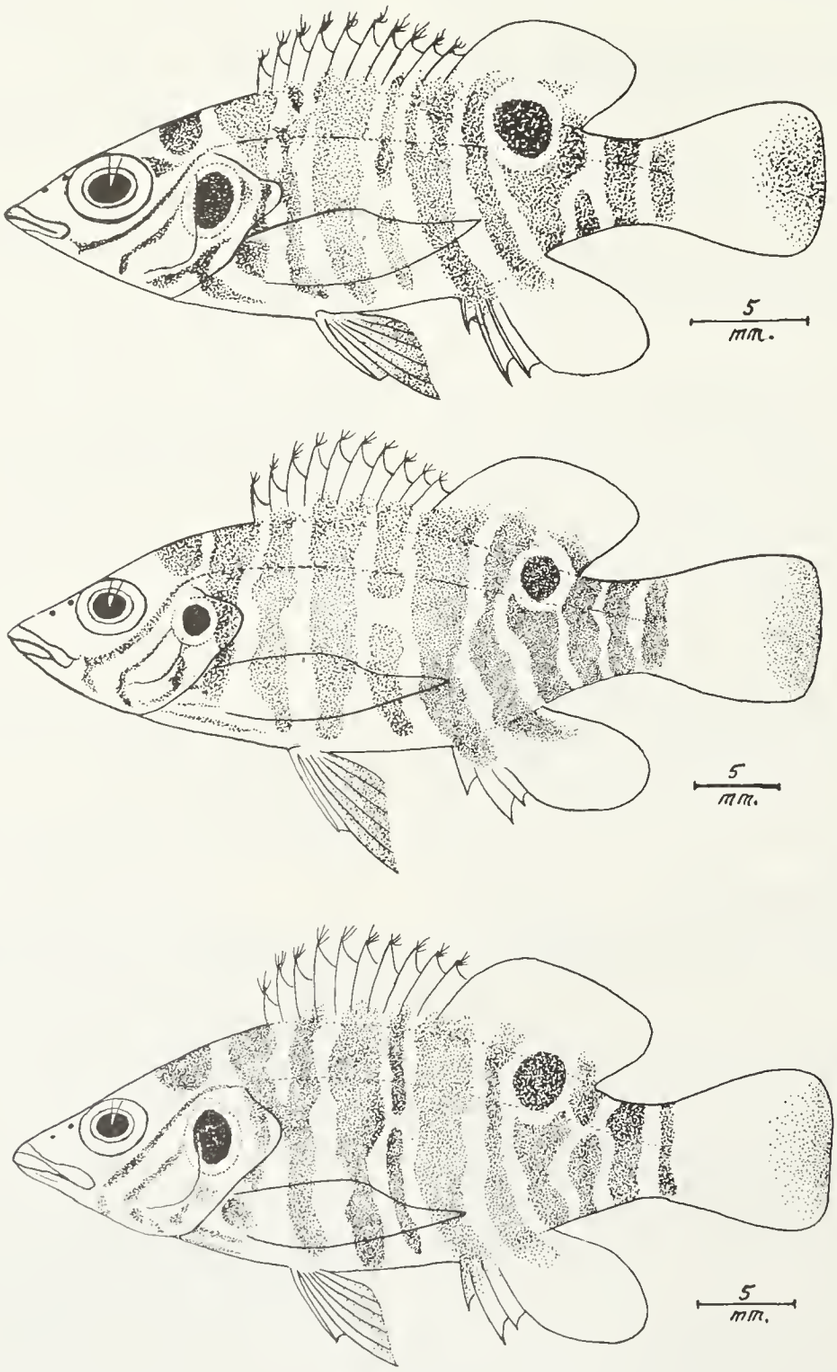


FIGURE 2.—*Cirrhitoidea bimacula* Jenkins. Variation.

postocular blotch, same on opercle, and another behind maxillary; mandible tip, and bar across mandible dark-brown; over all these colors head with many longitudinal, chrome-yellow to yellow-ochre, variable bars or lines. Often some of saddles along back variably dark to blackish. Body with orange-chrome to carmine, or scarlet-vermilion, numerous blotches, each smaller than pupil, scattered over entire head and trunk within dark areas. Spinous dorsal neutral-gray terminally, edge of each membrane whitish, fin otherwise white except three longitudinal rows of dull-orange spots. Soft dorsal gray-white, with subbasal series of dark-edged dull-orange blotches, also each ray with two or three pale-orange areas on outer portions. Caudal vinaceous-pink basally, whitish terminally; about six series of orange blotches basally on fin to dull-yellowish terminally, each marked with dull-brown ring. Anal white basally, with gray terminally; soft fin with five or six rows of dull-orange blotches, each ringed with slightly darker brown; two brown blotches on spinous anal terminally. Pectoral whitish, with subbasal dull orange-gray transverse band. Ventral whitish, gray terminally and each ray with dull-orange tints. Two specimens, 154 to 180 mm. Honolulu. R. W. Wehrle.

Common in Honolulu markets, July 19.

Cirrhitus oxycephalus (Bleeker).

Cirrhitichthys oxycephalus Schmeltz: Mus. Godeffroy, Cat. 7, p. 42, 1879 (Pelew [Palau] Islands).—Whitley: Pan-Pacific Inst., Jour., vol. 1, no. 2, p. 6, January-March, 1927 (Fiji).

Cirrhitus oxyrhynchos (Bleeker).

Cirrhitichthys oxyrhynchus Schmeltz: Mus. Godeffroy, Cat. 3, p. 8, 1866 (South Seas).—Schmeltz: op. cit., 7, p. 42, 1879 (Society Islands).

Paracirrhites polystictus (Günther).

Paracirrhites polystictus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 656, 1929 (1930) (Guam).

Paracirrhites forsteri (Schneider).

Cirrhites forsteri Schmeltz: Mus. Godeffroy, Cat. 7, p. 42, 1879 (Savaii).

Cirrhites forsterii Pöhl: op. cit., 9, p. 29, 1884 (Savaii).

Paracirrhites forsteri Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 656, 1929 (1930) (Honolulu).

Depth 2 3/5 to 2 3/4; head 2 3/4 to 2 4/5, width 2 1/8 to 2 1/4. Snout 2 7/8 to 3 in head; eye 6, 2 to 2 1/5 in snout, 1 to 1 1/4 in interorbital; maxillary reaches 1/3 in eye, expansion 1 1/5 to 1 1/4 in eye, length 2 1/2 in head; teeth in villiform bands in jaws, outer row enlarged; two upper front canines, three lower laterals, followed by single row of small equal teeth on each mandibular ramus; vomer with transverse band of fine teeth, none on palatines; interorbital 5 1/3 to 6 1/8, slightly concave; hind preopercle edge feebly and obscurely serrated. Gill rakers 5+11, short points, 1/2 of gill filaments, which 1 1/2 in eye.

Tubular scales 47 in lateral line to caudal base and 4 to 8 more on latter; 6 scales above lateral line, 12 below, 22 to 24 predorsal forward to nostrils; 5 or 6 rows on cheek to preopercle ridge. Scales with 10 basal radiating striae; circuli very fine.

D. X, 11, 1, fourth spine 2 2/3 in head, first ray 1 4/5 to 2; A. III, 6, 1, second spine 2 7/8, first ray 2; caudal 1 1/2 to 1 3/5, truncate, slightly convex as expanded; least depth of caudal peduncle 2 2/3; pectoral 1 3/5 to 1 4/5; ventral 1 7/8 to 1 9/10.

Head light wood-brown or isabella color, same extends on chest and breast. Back anteriorly burnt-umber, resolving into broad blackish band, above slightly narrower whitish parallel one, both extending in slight incline to caudal base. Lower flanks cadmium-orange to yellow ochre, becoming dusky-gray above anal posteriorly. Upper edge of back broad geranium-pink. On upper front of back chinese-orange spots mostly with dark or burnt-carmine centers. Iris pink. All of head, front of back, with slight rosy tint; also same including chest, breast, prepectoral region and pectoral basally with small, bright, flame-scarlet to chinese-orange spots, thickly strewn, some fused as short bars or streaks. Spinous dorsal pinkish, each membrane terminally and basally with ill-defined orange blotch. Soft dorsal transparent, base buff, subbasal olive-brown band, each ray dull-buff. Caudal whitish, upper and lower edges narrowly dusky, fin basally with chinese-orange cloudings. Anal transparent, grayish basally, lower or front edge narrowly dusky and each ray ochraceous. Pectoral transparent, each ray rosy. Ventral with membranes gray basally, transparent terminally, lower or front edge narrowly dusky, rays cadmium-orange. Four specimens, 75 to 174 mm. Honolulu. R. W. Wehrle.

Smallest example differs only in fewer and larger brown spots on head, few around prepectoral region, but none on chest or breast. Moreover, whole lower half of body from level with lower eye edge white, with some rose-purple shades along edge of black longitudinal band on tail. Spinous dorsal light or pale-brown, only very slightly neutral dusky terminally. Anal pale-gray, with slight olive-yelow tinge. Black longitudinal superior band on tail, also extends out over middle of caudal, reflected on median rays to hind caudal edge. Iris orange. Paired fins orange-yellow.

Two adults in Honolulu markets, March 30, three March 29.

Paracirrhites arcatus (Cuvier).

Cirrhites arcatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 42, 1879 (Savaii).

Cirrhites arcuatus Pöhl: op. cit., 9, p. 29, 1884 (Savaii).

Paracirrhites arcatus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 656, 1929 (1930) (Hawaiian Islands).

Back vermilion, sides below salmon to flesh color and under surface of body buff. Sides with indistinct pale streak along each row of scales. Broad, peach blossom-pink band, ill-defined, close above along lateral line, begins above middle of depressed pectoral and extends to caudal base. Head vermilion above, sides flesh color, below buff-white; front nostrils, lips and maxillary orange-chrome, with tip of mandible lemon-yellow. Iris rose-pink. Pale-olive postocular blotch longer than eye, inclined little upward, bordered all around with orange-chrome line and outer vermilion line. Lower portion of subopercle and interopercle with three orange bars, each bordered with vermilion line. Spinous dorsal salmon color, edges of membranes narrowly dusky, and base of fin rose-pink. Soft dorsal saturn-red basally, limited above by neutral-dusky line continued from edge of spinous dorsal; all outer half or more of fin with transparent membranes; rays pale-yellowish, little brighter terminally. Caudal membranes transparent, basally above saturn-red, though most of caudal base with vermilion tinge; rays dull-salmon color. Anal gamboge-yellow basally, neutral-gray terminally. Pectoral salmon color, marginally in front dusky. Nine specimens, 64 to 105 mm. Honolulu. R. W. Wehrle.

Small examples all differ in general olivaceous color of body, only peach-blossom pink band re-

maining. Olive postocular blotch same color as surrounding part of head, its orange-chrome border assuming simply a loup with outer bordering line blackish. Median lower edge of head or each inner mandibular border, besides median line of ishmus, dusky-slate. Iris orange. Inner grooves of maxillary, front edge of lower lip, front nostril and its flap, brilliant chrome-yellow. Caudal largely orange-yellow, variably scarlet basally. Paired fins olivaceous, orange-buff basally. Lips laterally variably orange to olivaceous.

Three in Honolulu markets, July 19.

Paracirrhites melanotus (Günther).

Cirrhites melanotus Schmeltz: Mus. Godeffroy, Cat. 7, p. 42, 1879 (Society Islands).—Pöhl: op. cit., 9, p. 29, 1884 (Mortlock).

Paracirrhites cinctus (Günther).

Paracirrhites cinctus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 656, 1929 (1930) (Hawaiian Islands).

CAPROIDAE (=ANTIGONIDAE)

Antigonia capros Lowe.

Antigonia capros Lowe: Zool. Soc. London, Proc., vol. 2, p. 85, 1843 (type loc., Madeira).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 3, 1929 (Hawaii).

One in Bishop Museum from Kau, Hawaii, October 28, 1927, length 195 mm., obtained by T. T. Dranga.

The above name supersedes *Antigonia steindachneri* as used in my "Fishes of Oceania."

MONODACTYLIDAE

Monodactylus argenteus (Linné).

Psettus argenteus Schmeltz: Mus. Godeffroy, Cat. 7, p. 45, 1879 (Samoa Islands).—Pöhl: op. cit., 9, p. 32, 1884 (Samoa).

Monodactylus argenteus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 13, 1929 (Apia).

PLATACIDAE

Platax pinnatus (Linné).

Chaetodon pinnatus Linné: Systema naturae, 10th ed., vol. 1, p. 272, 1758 (type loc., East Indies).

Platax pinnatus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 18, 1929 (Samoa and Borabora).

The above name replaces *Platax teira* as used in my "Fishes of Oceania."

Platax orbicularis (Forskål).

Platax orbicularis Schmeltz: Mus. Godeffroy, Cat. 3, p. 9, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 45, 1879 (Samoa).—Pöhl: op. cit., 10, p. 32, 1884 (Samoa).

EPHIPPIDAE

Drepane punctata (Linné).

Drepana punctata Schmeltz: Mus. Godeffroy, Cat. 7, p. 48, 1879 (Samoa Islands).

Drepane punctata Pöhl: op. cit., 9, p. 28, 1884 (Samoa).

TOXOTIDAE

Toxotes jaculator (Pallas).

Toxotes jaculator Whitley: Pan-Pacific Inst., Jour., vol. 1, no. 2, p. 6, January-March, 1927 (Fiji).

SCATOPHAGIDAE

Scatophagus argus (Linné).

Scatophagus argus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 35, fig. 1 (variations), 1929 (New Guinea).

Scatophagus tetracanthus (Lacépède).

Scatophagus tetracanthus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 40, 1929 (New Guinea).

CHAETODONTIDAE

Forcipiger longirostris (Broussonet).

Chelmo longirostris Schmeltz: Mus. Godeffroy, Cat. 7, p. 42, 1879 (Tahiti).—Pöhl: op. cit., 9, p. 28, 1884 (Tahiti), p. 44 (New Guinea).

Forcipiger longirostris Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 45, fig. 2 (variations), 1929 (Apia, Honolulu, Fakarava).

Two in Honolulu markets, March 29.

Coradion chrysozonus (Cuvier).

Chaetodon chrysozonus Pöhl: Mus. Godeffroy, Cat. 9, p. 44, 1884 (New Guinea).

? Chaetodon chrysopomus Pöhl: op. cit., 9, p. 28, 1884 (New Britain).

Parachaetodon ocellatus (Bloch).

Chaetodon ocellatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 41, 1879 (Samoa and Viti Islands).—Pöhl: op. cit., 9, p. 28, 1884 (Viti).

Chaetodon meyeri Schneider.

Chaetodon meyeri Schmeltz: Mus. Godeffroy, Cat. 7, p. 41, 1879 (Pelew Islands).

Tetragonopterus meieri Pöhl: op. cit., 9, p. 44, 1884 (New Guinea).

In the Queensland Museum one specimen 138 mm. long from Kaewieng, New Ireland, obtained by Dr. J. Jackson.

Chaetodon ornatissimus Cuvier.

Chaetodon ornatissimus Schmeltz: Mus. Godeffroy, Cat. 3, p. 8, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 41, 1879 (Samoa and Tahiti).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 63, fig. 5 (young), 1929 (Hawaiian Islands, Apia, Hawaii, Honolulu).

Chaetodon trifasciatus Mungo Park.

Chaetodon trifasciatus Fowler and Bean: U. S. Nat. Mus., Bull., no 100, vol. 8, p. 65, 1929 (Apra Bay on Guam, Hawaiian Islands, Fiji, New Guinea, Suva, Apia, Mangareva, Fakarava).

Chaetodon vittatus Schmeltz: Mus. Godeffroy, Cat. 1, p. 8, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 6, 1865 (South Seas).—Schmeltz: op. cit., 3, p. 8, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 41, 1879 (South Sea Islands).—Pöhl: op. cit., 9, p. 27, 1884 (South Seas), p. 44 (New Guinea).

Chaetodon ephippium Cuvier.

Chaetodon ephippium Schmeltz: Mus. Godeffroy, Cat. 1, p. 8, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 6, 1865 (South Seas).—Schmeltz: op. cit., 3, p. 7, 1866 (South Seas).—Schmeltz: op. cit., 7, p. 41, 1879 (Samoa and Tahiti).—Pöhl: op. cit., 9, p. 28, 1884 (Samoa).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol.

8, p. 70, 1929 (Apra Bay on Guam, New Guinea, Apia, Honolulu).

In the Queensland Museum one 163 mm. long from the South Sea Islands, obtained by Capt. Browne.

Chaetodon bennetti Cuvier.

Chaetodon bennettii Schmeltz: Mus. Godeffroy, Cat. 7, p. 41, 1879 (Apaman Island, Gilbert Group).—Pöhl: op. cit., 9, p. 28, 1884 (Apamana Island).

Chaetodon plebeius Cuvier.

Chaetodon plebeius Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 78, 1929 (compiled).

In our review of chaetodontid fishes *Megaprotodon* is merged with *Chaetodon*.

Chaetodon semeion Bleeker.

Chaetodon semeion Schmeltz: Mus. Godeffroy, Cat. 3, p. 7, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 41, 1879 (Samoa and Tonga).—Pöhl: op. cit., 9, p. 28, 1884 (Tonga).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 79, 1929 (Apia).

Chaetodon fremblii Bennett.

Chaetodon fremblii Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 53, 1929 (Hawaii and Laysan).

Depth 1 2/3 to 1 4/5; head 3 1/3 to 3 2/5, width 2 to 2 1/10. Snout 2 7/8 to 3 in head from snout tip: eye 3 2/5 to 3 3/4, 1 1/8 to 1 1/5 in snout, 1 to 1 1/8 in interorbital; maxillary reaches front nostril or about 2/3 to 3/4 in snout, length 3 4/5 to 4 in head from snout tip; interorbital 3 1/3 to 3 2/3, convexly elevated. Gill rakers 3+11, short points, 1/5 of gill filaments, which 1 2/5 in eye.

Scales 47 to 50 between gill opening and caudal base; tubes 37 to 40 in lateral line; 11 or 12 scales above, 26 or 27 below. Scales with 12 to 14 basal radiating striae; apical denticles 70 to 73, with 3 or 4 transverse series of basal elements; circuli very fine.

D. XIII, 23, 1, or 21, 1, fourth spine 1 2/5 to 1 4/5, first ray 1 1/2 to 1 3/4; A. III, 17, 1, or 18, 1, second spine 1 2/5 to 1 3/4, first ray 1 2/5 to 1 3/5; caudal 1 1/5 to 1 1/4, obliquely truncate; least depth of caudal peduncle 3 to 3 1/8; pectoral 1 1/8 to 1 1/5; ventral 1 to 1 1/10.

Generally bright-yellow with slightly dark or gray-brown shades on back, edges of most scales slightly darker. Black predorsal saddle larger than eye. Large black blotch on soft dorsal posteriorly, extends down over caudal peduncle narrowing below, ends as small spot on hind edge of anal. Body with eight longitudinal gray-blue narrow bands, all slightly inclined posteriorly and edged with dark neutral-gray line; all slightly converge at head, where very variably broken; second borders lower edge and front of predorsal black saddle; fourth to sixth border upper front edges of soft dorsal black blotch. Iris yellow. Dorsals yellow, with uppermost gray-blue band of body extending out subterminally on soft fin; on spinous fin median gray-blue band, which submarginal on hind part of fin and not extended on soft fin. Soft dorsal with black submarginal line and narrow white edge all around. Soft anal like soft dorsal. Caudal grayish basally, then dark-neutral line borders median brilliant lemon-yellow crescent and hind edge of fin broadly gray. Pectoral pale-brown. Ventral yellow, with some neutral-gray shades. Four specimens 112 to 138 mm. Honolulu. R. W. Wehrle.

This species is greatly variable in the details of its markings. Baldwin's water-color painting as published by Jordan and Evermann is quite crude. The black bordering line on the yellow crescent in the caudal above and below, as well as posteriorly, does not occur on my example. Curiously enough the only dark bordering line is anterior.

Four in Honolulu markets March 29, two March 31, three April 1.

Chaetodon corallicola Snyder (fig. 3).

Chaetodon corallicola Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 84, 1929 (type and paratype).

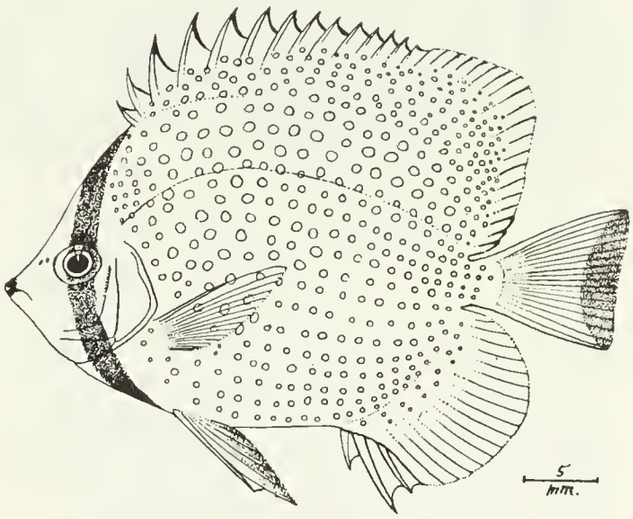


FIGURE 3.—*Chaetodon corallicola* Snyder.

Depth 1 2/3 to 1 3/4; head 3 2/5 to 3 3/5, width 1 7/8 to 2. Snout 3 1/5 to 3 1/4 in head; eye 2 3/4 to 3, greater than snout or interorbital; maxillary reaches slightly beyond front nostril but not to eye, length 4 1/5 to 4 3/4 in head; interorbital 3 to 3 1/8, convex; preopercle edge entire. Gill rakers 5 + 18, short points, 1/5 of gill filaments, which 1 2/3 in eye.

Scales 30 to 32 betwen suprascapula and caudal base; tubular scales 32 in lateral line; 5 scales above lateral line to spinous dorsal base, 15 or 16 below. Scales with 15 to 17 basal radiating striae; 90 to 97 apical denticles, small, with 2 to 5 transverse series of basal elements; circuli fine.

D. XIII, 21, 1, or 22, 1, seventh spine 1 1/3 in head, ninth ray 1 1/8; A. III, 17, 1, or 18, 1, second spine 1 2/5 to 1 1/2, fifth ray 1 1/5 to 1 1/4; least depth of caudal peduncle 3 to 3 1/8; caudal 1 1/10, obliquely truncate behind; pectoral 1 1/10; ventral 1.

Back, head generally, and sides largely olivaceous, becoming yellow-ochre on tail posteriorly, soft dorsal and anal. Lips slate-black, teeth white. Iris neutral or slate-black. Blackish-sepia band, little narrower than eye, extends from predorsal down to eye, then below over cheek, side of chest and down on breast joins its fellow at preventral. Whole trunk, tail, squamous area on dorsals, anal base and sides of chest with small plumbeous or gray spots, variably larger on larger scales, much smaller on sides of breast and fins. Spinous dorsal membrane dusky-brown. Soft dorsal with black submarginal line and white narrow edge. Spinous anal membrane dusky-ochraceous, edge of soft fin like that of soft dorsal. Anal lemon-yellow, hind edge broadly gray. Pectoral dark-gray terminally, paler basally. Ventral largely neutral or slate-black, each membrane with gray streak. Two specimens 87 or 88 mm. Honolulu. R. W. Wehrle.

The type as figured by Snyder evidently imperfect, as the dark band from the eye is not shown along the side of the breast.

Chaetodon miliaris Quoy and Gaimard (fig. 4).

Chaetodon miliaris Schmeltz: Mus. Godeffroy, Cat. 3, p. 8, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 41, 1879 (South Seas).—Pöhl: op. cit., 9, p. 28, 1884 (South Seas).—Fowler and Ball: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 85, 1929 (Honolulu, Hanalei Bay, Maui, Hawaii).

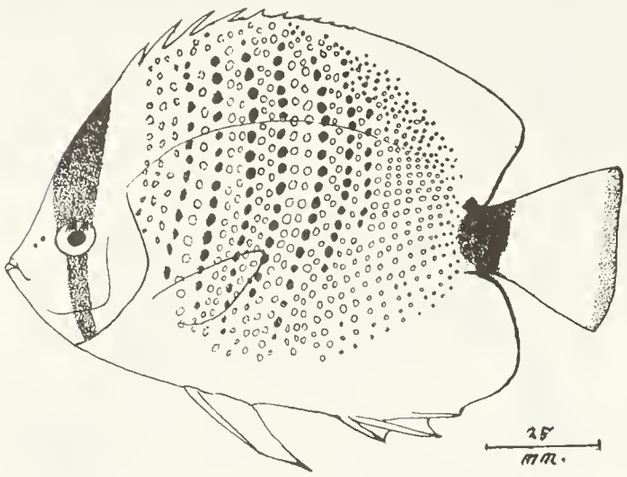


FIGURE 4.—*Chaetodon miliaris* Quoy and Gaimard.

Depth 1 1/2 to 1 3/5; head 3 1/4 to 3 1/2, width 2. Snout 3 in head from snout tip; eye 3, equals snout or interorbital to greater than interorbital; maxillary reaches opposite front nostril or 3/5 in snout, 4 in head; interorbital 3 1/4 to 3 1/2, convex. Gill rakers 5 + 12, short points, 1/3 of gill filaments which 1 2/3 in eye.

Scales 43 to 46 from suprascapula to caudal base; scales 36 to 40 in lateral line; 9 scales above lateral line, 20 to 24 below. Scales with 15 basal radiating striae; apical denticles 88, with 14 transverse series of basal elements; circuli very fine.

D. XIII, 22, 1, or 23, 1, fourth spine 1 1/3 to 1 2/5 in head, fourth ray 1 1/5 to 1 1/2; A. III, 20, 1, third spine 1 1/3 to 1 3/5, fourth ray 1 1/8 to 1 1/4; caudal 1, truncate; least depth of caudal peduncle 2 7/8 to 3; pectoral 1 to 1 1/8; ventral 1 to 1 1/8.

Generally dull-yellow, becoming bright sulphur-yellow on soft dorsal, anal, caudal and ventral fins. On sides and back each scale with rounded gray to dusky or dusky-gray spot, all much less than pupil. Also about eight series obliquely inclined from vertical of parallel darker spots, leaving one or two intermediate rows of paler spots. Vertical blackish-brown band from predorsal nearly vertical down to eye, which nearly equal in width; below eye band narrower, but not meeting below on breast; posterior margin of band with narrow diffuse-gray bordering area, which broad over cheek in front; caudal peduncle broadly black. Edges of spinous and soft dorsal, also soft anal, narrowly dusky; caudal broadly grayish behind. Pectoral transparent. Snout and interorbital yellowish. Five specimens, 107 to 130 mm. Honolulu. R. W. Wehrle.

The figures by Jordan and Evermann, besides the one I published later, fail to note the spotted coloration.

Chaetodon citrinellus Cuvier.

Chaetodon citrinellus Schmeltz: Mus. Godeffroy, Cat. 2, p. 7, 1865 (Samoa).—Schmeltz: op. cit., 3, p. 8, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 41, 1879 (Samoa).—Pöhl: op. cit., 9, p. 28, 1884 (South Seas).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 86, 1929 (Apia, Fiji, or Samoa?).

Four in Honolulu markets, April 1.

Chaetodon quadrimaculatus Gray.

Chaetodon quadrimaculatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 41, 1879 (Samoa).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 88, 1929 (Honolulu and Hawaiian islands).

Two in Honolulu markets, March 29.

Chaetodon punctato-fasciatus Cuvier.

Chaetodon punctato-fasciatus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 89, 1929 (Honolulu).

?*Tetragonopterus punctiformis* Pöhl: Mus. Godeffroy, Cat. 9, p. 44, 1884 (New Guinea).

Two in Honolulu markets, March 29, twenty March 30.

Chaetodon pelewensis Kner.

Chaetodon pelewensis Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 96, 1929 (Apia).

Chaetodon lunula (Lacépède).

Chaetodon lunula Schmeltz: Mus. Godeffroy, Cat. 1, p. 8, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 6, 1865 (South Seas).—Schmeltz: op. cit., 3, p. 8, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 41, 1879 (South Sea Islands).—Pöhl: op. cit., 9, p. 28, 1884 (South Seas).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 96, 1929 (Apra Bay on Guam, Apia, Honolulu, Puako Bay, Waialua Bay, Hawaii, Paumotus, Arhno Atoll, Wotje, Oahu, Hilo).

Chaetodon melannotus Schneider.

Chaetodon melannotus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 101, 1929 (Apra Bay on Guam, and Apia).

Chaetodon dorsalis Schmeltz: Mus. Godeffroy, Cat. 2, p. 7, 1865 (Samoa).—Schmeltz: op. cit., 3, p. 8, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 41, 1879 (Samoa, Viti, and Tonga).—Pöhl: op. cit., 9, p. 28, 1884 (Samoa).

Chaetodon reticulatus Cuvier.

Chaetodon reticulatus Schmeltz: Mus. Godeffroy, Cat. 1, p. 8, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 6, 1865 (South Seas).—Schmeltz: op. cit., 3, p. 8, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 41, 1879 (South Seas).—Pöhl: op. cit., 9, p. 27, 1884 (South Seas).—Whitley: Pan-Pacific Inst., Jour., vol. 1, no. 2, p. 6, January-March, 1927 (Fiji).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 107, 1929 (Apia).

Chaetodon selene Bleeker.

Tetragonopterus selene Pöhl: Mus. Godeffroy, Cat. 9, p. 44, 1884 (New Guinea).

Chaetodon dahli Ahl.

Chaetodon dahli Ahl: Archiv Naturgesch., vol. 89, abth. A, heft 5, p. 143, pl. 1, fig. 3, 1923 (type loc., Ralum, Bismark Archipelago).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 110, 1929 (compiled).

Chaetodon unimaculatus (part) Fowler: B. P. Bishop Mus., Mem. 10, p. 251, 1929 (on Ahl).

Chaetodon unimaculatus Bloch.

Chaetodon unimaculatus Schmeltz: Mus. Godeffroy, Cat. 2, p. 7, 1865 (Samoa).—Schmeltz: op. cit., 3, p. 8, 1866 (Samoa).—Schmeltz: op. cit., 9, p. 28, 1884 (South Seas), p. 44 (New Guinea).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 110, 1929 (Apra Bay on Guam, Honolulu, Hawaii, Apia, type of *Chaetodon sphenospilus*).

Canary-yellow, nearly white on sides of abdomen. Snout tip dusky. Broad black band from predorsal, nearly wide as eye, extends down over breast but not to ventrals. Eye gray-white, only dark blotch or shade

reflecting dark band. At summit of lateral line large rounded black spot, twice or over diameter of eye and margined all around with whitish. Above pectoral each row of enlarged scales with oblique marginal dark olive-yellow line. Dorsals lemon-yellow, posterior broad border of soft fin black, which crosses caudal peduncle as black bar and reflected similarly on soft anal, all along its front edge narrow pearl-white border; rest of anal similarly lemon-yellow. Caudal whitish. Pectoral whitish. Ventral lemon-yellow. One specimen 107 mm. Honolulu. R. W. Wehrle.

One from Guam, 50 mm. long, obtained by Lieut. H. Hornbostel in 1926, in Bishop Museum.

Chaetodon kleinii Bloch.

Chaetodon kleinii Schmeltz: Mus. Godeffroy, Cat. 7, p. 41, 1879 (Yap).—Fowler and Bean: U. S. Nat. Mus., Bull. no. 100, vol. 8, p. 113, 1929 (Samoa and Jaluit).

Chaetodon auriga Forskål.

Chaetodon auriga Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 116, 1929 (Apra Bay on Guam, Fanning Islands, Johnston Island, Apia, Honolulu, Makemo, Tari Tari, Kusaie, Samoa or Hawaii?).

Chaetodon setifer Schmeltz: Mus. Godeffroy, Cat. 1, p. 8, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 7, 1865 (South Seas).—Schmeltz: op. cit., 3, p. 7, 1866 (South Seas).—Schmeltz: op. cit., 7, p. 41, 1879 (Samoa and Tahiti).—Pöhl: op. cit., 9, p. 28, 1884 (South Seas), p. 44 (New Guinea).—Fowler: B. P. Bishop Mus., Mem. 10, p. 252, pl. 26 A, 1929 (Hawaii, Samoa, Honolulu, Kusaie, Makemo, Tari Tari, Apia, Johnston Island, Fanning Islands, Hilo, Society Islands, Apiang, Paanopa, Ebon Island, French Frigates Shoal, Wake Island).

Two in Honolulu markets, March 31, three April 1.

Chaetodon humeralis Günther is reported as "*Chaetodon humereis* Bleeker" by Schmeltz: Mus. Godeffroy, Cat. 1, p. 8, 1864 (South Seas). Possibly it may have been intended for the present species?

Chaetodon vagabundus Linné.

Chaetodon vagabundus Schmeltz: Mus. Godeffroy, Cat. 1, p. 8, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 6, 1865 (South Seas).—Schmeltz: op. cit., 3, p. 8, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 41, 1879 (South Sea Islands).—Pöhl: op. cit., 9, p. 28, 1884 (South Seas).—Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 120, 1929 (New Guinea, Samoa, Apia).

Chaetodon pictus Pöhl: op. cit., 9, p. 44, 1884 (New Guinea).

Chaetodon rafflesii Bennett.

Chaetodon rafflesii Schmeltz: Mus. Godeffroy, Cat. 7, p. 41, 1879 (Pelew and Viti Islands).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 125, 1929 (Apia).

Chaetodon rafflessi Pöhl: op. cit., 9, p. 28, 1884 (Viti Islands).

Chaetodon mertensii Cuvier.

Chaetodon mertensii Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 127, 1929 (Apia).

Chaetodon lineolatus Cuvier.

Chaetodon lineolatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 41, 1879 (Upolu).—Pöhl: op. cit., 9, p. 28, 1884 (Apia).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 130, 1929 (Hawaii and Rikitea).

Three in Honolulu markets, March 29.

Chaetodon oxycephalus Bleeker.

Chaetodon oxycephalus Bleeker: Nat. Tijds. Ned. Indie, vol. 4, p. 603, 1853 (type loc., Ternate).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 132, 1929 (Philippines and East Indies).

Chaetodon lineolatus (part) Fowler: B. P. Bishop Mus., Mem. 10, p. 255, 1928 (on Ahl).

Chaetodon falcula Bloch.

Chaetodon falcula Schmeltz: Mus. Godeffroy, Cat. 7, p. 41, 1879 (Samoa and Tonga).—Pöhl: op. cit., 9, p. 28, 1884 (Samoa).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 134, 1929 (Apra Bay on Guam, Apia, Makemo).

Chaetodon triangulum Cuvier.

Chaetodon triangulum (Kuhl and Van Hasselt) Cuvier: Hist. Nat. Poiss., vol. 7, p. 34 (44), 1831 (type loc., Batavia).—Pöhl: op. cit., 9, p. 28, 1884 (New Britain).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 136, 1929 (New Guinea).

Tetragonopterus triangulus Pöhl: op. cit., 9, p. 44, 1884 (New Guinea).

Gonochaetodon baronessa Fowler: B. P. Bishop Mus., Mem. 10, p. 257, 1928 (New Guinea).

Chaetodon trifascialis Quoy and Gaimard.

Chaetodon trifascialis Quoy and Gaimard: Voyage "Uranie," Zool., p. 379, pl. 62, fig. 5, 1825 (type loc., Guam).—Schmeltz: Mus. Godeffroy, Cat. 7, p. 41, 1879 (Samoa Islands).—Pöhl: op. cit., 9, p. 28, 1884 (Samoa).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 139, 1929 (Apra Bay on Guam, Apia, Fakarava).

Chaetodon strigangulus Schmeltz: op. cit., 1, p. 8, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 6, 1865 (South Seas).—Schmeltz: op. cit., 3, p. 7, 1866 (South Seas).—Schmeltz: op. cit., 7, p. 41, 1879 (South Seas).—Pöhl: op. cit., 9, p. 27, 1884 (South Seas).

Megaprotodon strigangulus Fowler: B. P. Bishop Mus., Mem. 10, p. 256, 1928 (Agana on Guam, Raiatea, Apia, Fakarava).

Microcanthus strigatus (Cuvier).

Microcanthus strigatus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 144, fig. 7 (young), 1929 (Hawaii and Oahu).

Two in Honolulu markets, March 29.

Heniochus varius (Cuvier).

Heniochus varius Pöhl: Mus. Godeffroy, Cat. 9, p. 28, 1884 (Viti).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 147, 1928 (New Guinea and Apia).

Heniochus monoceros Cuvier.

Heniochus monoceros Schmeltz: Mus. Godeffroy, Cat. 3, p. 8, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 42, 1879 (Samoa).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 149, 1929 (Hawaii and Rikitea).

Heniochus permutatus Cuvier.

Heniochus permutatus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 151, 1929 (Samoa).

Heniochus chrysostoma Schmeltz: Mus. Godeffroy, Cat. 7, p. 42, 1879 (South Sea Islands).—Pöhl: op. cit., 9, p. 28, 1884 (Viti).

Heniochus acuminatus (Linné).

Heniochus acuminatus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 154, 1929 (Hawaii, Samoa, Honolulu, Fiji).

Heniochus macrolepidotus Schmeltz: Mus. Godeffroy, Cat. 2, p. 7, 1865 (Samoa).—Schmeltz: op. cit., 3, p. 8, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 42, 1879 (Apaman Island, Gilbert Group).—Pöhl: op. cit., 9, p. 28, 1884 (Apamana Island), p. 44 (New Guinea).

Holacanthus vrolikii Bleeker.

Holocanthus vrolikii Pöhl: Mus. Godeffroy Cat. 9, p. 28, 1884 (Ponape).

Holacanthus trimaculatus Cuvier.

Holacanthus trimaculatus Pöhl: Mus. Godeffroy, Cat. 9, p. 44, 1884 (New Guinea).

Holacanthus diacanthus (Boddaert).

Holacanthus diacanthus Schmeltz: Mus. Godeffroy, Cat. 3, p. 8, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 42, 1879 (Samoa).—Pöhl: op. cit., 9, p. 28, 1884 (Samoa). —Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 169, fig. 8 (variation) (Samoa, Pago Pago).

Holacanthus flavissimus Cuvier.

Holacanthus flavissimus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 172, 1929 (Samoa).

Holacanthus cyanotis Schmeltz: Mus. Godeffroy, Cat. 3, p. 8, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 42, 1879 (Samoa).—Pöhl: op. cit., 9, p. 28, 1884 (Samoa).

Holacanthus bicolor (Bloch).

Holacanthus bicolor Schmeltz: Mus. Godeffroy, Cat. 3, p. 8, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 42, 1879 (Samoa).—Pöhl: op. cit., 9, p. 28, 1884 (Samoa), p. 44 (New Guinea).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 172, 1929 (New Guinea, Samoa, Pago Pago).

Holacanthus arcuatus Gray.

Holacanthus arcuatus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 176, 1929 (Honolulu).

Holacanthus potteri Jordan and Metz.

Holacanthus potteri Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 183, 1929 (type).

Two in Honolulu markets, March 31.

Holacanthus fisheri Snyder.

Holacanthus fisheri Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 183, 1929 (type, south coast of Oahu, between Maui and Lanai, Hawaii).

Holacanthus semicirculatus Lesson.

Holacanthus semicirculatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 42, 1879 (Kandavu).—Pöhl: op. cit., 9, p. 28, 1884 (Kandavu).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 185, fig. 9 (variation) 1929 (Samoa).

Holacanthus nicobariensis (Schneider).

Holacanthus nicobariensis Schmeltz: Mus. Godeffroy, Cat. 3, p. 8, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 42, 1879 (Samoa).—Pöhl: op. cit., 9, p. 28, 1884 (Samoa).

Holacanthus imperator (Bloch).

Holocanthus imperator Schmeltz: Mus. Godeffroy, Cat. 7, p. 42, 1879 (Kandavu).—Pöhl: op. cit., 9, p. 28, 1884 (Kandavu).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 189, 1929 (Suva).

ZANCLIDAE

Zanclus canescens (Linné).

Zanclus canescens Whitley: Pan-Pacific Inst., Jour., vol. 3, p. 12, January-March, 1928 (Santa Cruz Islands). —Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 196, 1929 (Apra Bay on Guam, New Guinea, Hawaii, Puako Bay, Honolulu, Laysan, Pago Pago, Jaluit, Samoa).

Zanclus cornutus Schmeltz: op. cit., 2, p. 7, 1865 (Samoa).—Schmeltz: op. cit., 2, p. 7, 1865 (Samoa).—Schmeltz: op. cit., 3, p. 9, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 46, 1879 (South Seas).—Pöhl: op. cit., 10, p. 32, 1884 (Samoa).

One example in the Queensland Museum, 158 mm. long, from Kaewieng, New Ireland, obtained by Dr. J. Jackson.

Young specimen in Honolulu markets, March 31.

HEPATIDAE

Ctenochaetus strigosus (Bennett).

Acanthurus strigosus Schmeltz: Mus. Godeffroy, Cat. 7, p. 50, 1879 (South Sea Islands).

Ctenochaetus strigosus Herre: Philippine Jour. Science, vol. 34, no. 4, p. 438, pl. 15, figs. 2-3, December 1927 (Guam).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 200, 1929 (Apra Bay on Guam, Tahiti, New Guinea, Apia, Hawaii, Honolulu, Kailua, Mangareva, Papeete).

Acanthurus ctenodon Schmeltz: op. cit., 2, p. 7, 1865 (South Seas).—Schmeltz: op. cit., 3, p. 10, 1866 (Samoa; McKean's Island, Phoenix Group).—Pöhl: op. cit., 9, p. 31, 1884 (South Seas).

Ctenochaetus ctenodon Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Ctenochaetus striatus Herre: op. cit., p. 437, pl. 13, fig. 2, December, 1927 (Guam).

Generally deep-violaceous or indian-purple, with neutral-gray tints, also tinge of orange-ochraceous about costal and postocular region. Head very finely but obscurely spotted or dotted with plumbeous to mouse-gray. Whole trunk, tail and vertical fins marked with many parallel longitudinal narrow inconspicuous lilac-gray lines. Iris neutral-gray, narrow ring around pupil yellow and around edge of eyelid and eyeball cadmium-yellow. Lips neutral-black, teeth pale-brown. All vertical fins with much more general slate-black tint than body. Caudal spine deep-brown. Pectoral with orange medially, marginally dusky to quite dark. Ventral deep burnt-carmine, marginally all along front edge black, inner rays more neutral tint. Length 140 mm. Honolulu. R. W. Wehrle.

Twenty-five adults in Honolulu markets, March 30, one young March 31, ten April 1, five April 2.

Paracanthurus theuthis (Lacépède).

Acanthurus hepatus (non Linné) Schmeltz: Mus. Godeffroy, Cat. 7, p. 50, 1879 (Pelew Islands).—Pöhl: op. cit., 10, p. 30, 1884 (Pelew Islands).

Hepatus fuliginosus (Lesson).

Acanthurus fuliginosus Herre: Philippine Jour. Science, vol. 34, no. 4, p. 430, pl. 16, fig. 3, December, 1927 (Honolulu).

Hepatus fuliginosus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 211, 1929 (Hawaiian islands, Honolulu).

Acanthurus blochii Schmeltz: Mus. Godeffroy, Cat. 1, p. 9, 1864 (South Seas).

Acanthurus matoides Schmeltz: op. cit., 3, p. 10, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 49, 1879 (Samoa).—Pöhl: op. cit., 10, p. 30, 1884 (Samoa).

Acanthurus bipunctatus Schmeltz: op. cit., 7, p. 49, 1879 (Yap).—Pöhl: op. cit., 10, p. 31, 1884 (Yap).

Hepatus elongatus (Lacépède).

Teuthis elongatus Whitley: Pan-Pacific Inst., Jour., vol. 1, no. 2, p. 6, January-March, 1927 (Fiji).

Hepatus elongatus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 213, 1929 (Hawaiian Islands, Apia, Truk, type of *Hepatus aquilinus* Jordan and Seale).

Acanthurus nigros Schmeltz: Mus. Godeffroy, Cat. 2, p. 7, 1865 (MacKean Islands, Phoenix Group).—Schmeltz:

op. cit., 3, p. 10, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 49, 1879 (Samoa).

Acanthurus nigrus Pöhl: op. cit., 10, p. 31, 1884 (Samoa).

Acanthurus nigroris Herre: Philippine Jour. Science, vol. 34, no. 4, p. 428, pl. 4, fig. 1, December, 1927 (Guam).

Hepatus leucopareius (Jenkins).

Hepatus leucopareius Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 214, 1929 (type, Apia, Puako Bay and Easter Island).

One in Honolulu markets, March 30, twenty March 31, two April 1.

One in the market at Suva, Fiji, 105 mm. long, obtained in 1926, in Bishop Museum.

Hepatus lineatus (Linné).

Acanthurus lineatus Schmeltz: Mus. Godeffroy, Cat. 1, p. 9, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 7, 1865 (South Seas).—Schmeltz op. cit., 3, p. 10, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 49, 1879 (South Seas).—Pöhl: op. cit., 10, p. 30, 1884 (South Seas).—Herre: Philippine Jour. Science, vol. 34, no. 4, p. 420, pl. 14, fig. 1, December, 1927 (Guam).

Teuthis lineatus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Hepatus lineatus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 217, fig. 12 (variation) 1929 (Samoa, Solomon Islands, Apia).

Acanthurus striatus Schmeltz: Mus. Godeffroy, Cat. 2, p. 8, 1865 (Samoa).—Schmeltz: op. cit., 3, p. 10, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 49, 1879 (South Sea).

In the Queensland Museum two specimens 238 to 250 mm. long from Florida, Solomon Islands, secured by Mr. Barry.

Hepatus bleekeri (Günther).

Hepatus bleekeri Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 220, 1929 (Fakarava).

Hepatus bariene (Lesson).

Hepatus bariene Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 222, 1929 (Honolulu, Hawaii).

Two in Honolulu markets, March 29, three April 1.

Hepatus lineolatus (Valenciennes).

Hepatus lineolatus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 228, 1928 (Hawaii, Apia, Truk, Honolulu).

Very dark, neutral vandyke-brown, with paler or olivaceous tinge or cloudings on front of head. Body with traces of very numerous waved gray lines, often irregular or broken. Dorsals and anals all dusky or blackish-brown, with slaty shades on some membranes, and black blotch at bases of last rays in each fin. Socket of caudal spine narrowly black. Iris olivaceous-dusky. Lips blackish, teeth pale. Caudal dusky-gray. Pectoral dark-gray, with brownish-olive shade medially. Ventral olivaceous, dusky to blackish terminally. Two, 123 to 133 mm. Honolulu. R. W. Wehrle.

Hepatus olivaceus (Schneider).

Acanthurus olivaceus Schmeltz: Mus. Godeffroy, Cat. 7, p. 50, 1879 (South Seas).—Pöhl: op. cit., 10, p. 31, 1884 (South Seas).

Hepatus olivaceus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 231, 1929 (Apia, Hawaiian islands).

Generally sepia, clouded somewhat in places. Iris neutral-dusky, with narrow golden circle around pupil. On hind opercle edge broad cadmium-yellow horizontal band begins, its width about equal to eye diameter, not quite extended far back as depressed pectoral tip and all around broadly bordered blackish, especially behind. Lips dusky, teeth pale. Vertical fins all neutral-dusky, little more blackish terminally; soft dorsal with marginal and two parallel, subterminal, ill-defined, narrow, blackish bands; anals like soft dorsal only dark subterminal bands less distinct, besides fin edge narrowly gray-white; along bases of both dorsals and anals narrow dusky gamboge-yellow band whole extent of fins; caudal with broad pearl-white subterminal band within hind emargination, hind edge of fin narrowly dusky, also front boundary dusky; rest of caudal with sepia tint of body color, fin obscurely and rather closely spotted with darker. Pectoral sepia, broad hind border whitish and subterminally neutral-dusky, membranes obscurely blotched darker. Ventral neutral-sepia basally, slate black terminally. Length 229 mm. Honolulu R. W. Wehrle.

Hepatus nigricans (Linné).

Hepatus nigricans Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 233, 1929 (New Guinea, Apia, Suva).

Acanthurus gahm Schmeltz: Mus. Godeffroy, Cat. 7, p. 49, 1879 (Upolu).—Pöhl: op. cit., 10, p. 30, 1884 (Apia).

Hepatus maculiceps Ahl.

Hepatus maculiceps Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 240, fig. 13, 1929 (Philippines and East Indies).

Hepatus leucosternon (Bennett).

Hepatus leucosternon Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 243, fig. 14, 1929 (Puako Bay, Hawaii).

Hepatus glaucopareius (Schneider).

Acanthurus glaucopareius Schmeltz: Mus. Godeffroy, Cat. 2, p. 7, 1865. (MacKean Island, Phoenix Group).—Schmeltz: op. cit., 3, p. 10, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 49, 1879 (South Seas).—Pöhl: op. cit., 10, p. 31, 1884 (South Seas).

Hepatus glaucopareius Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 246, 1929 (Apra Bay on Guam, Honolulu, Samoa, Apia).

Hepatus achilles (Shaw).

Acanthurus achilles Schmeltz: Mus. Godeffroy, Cat. 3, p. 10, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 50, 1879 (Samoa, Phoenix and Society Islands).—Pöhl: op. cit., 10, p. 31, 1884 (Samoa).—Herre: Philippine Jour. Science, vol. 34, no. 4, p. 414, pl. 2, fig. 1, December, 1927 (Guam).

Hepatus achilles Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 247, 1929 (Fannings, Hawaii, Apia, Honolulu).

Hepatus guttatus (Schneider).

Acanthurus guttatus Schmeltz: Mus. Godeffroy, Cat. 1, p. 9, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 7, 1865 (South Seas).—Schmeltz: op. cit., 3, p. 10, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 49, 1879 (South Seas).—Pöhl: op. cit., 10, p. 30, 1884 (Samoa).

Hepatus guttatus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 248, 1929 (Apia and Tari Tari).

Hepatus triostegus (Linné).

Acanthurus triostegus Schmeltz: Mus. Godeffroy, Cat. 1, p. 9, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 7, 1865 (South Seas).—Schmeltz: op. cit., 3, p. 10, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 49, 1879 (South Seas).—Pöhl: op. cit., 10, p. 31, 1884 (South Seas).—Herre: Philippine Jour. Science, vol. 34, no. 4, p. 407, pl. 1, fig. 1, December, 1927 (Guam).

Teuthis triostegus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Hepatus triostegus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 249, 1929 (Apra Bay on Guam, Fannings, New Guinea, Tahiti, Samoa, Bougainville Island, Apia, Mangareva, Jaluit, Fakarava, Arhno: as *sandvicensis* Hawaiian islands, Honolulu, Johnston Island, Puako Bay, Hanalei Bay, Napili, Hilo, Waialua Bay, Necker, Laysan, Kailua).

Generally dull-oil to olive-green on back, becoming gray-white to pure-white on under or lower surfaces. Front of head variably with one to five dark-brown blotches, often simply grayish. Five, blackish-brown, narrow, transverse bands, all narrowing above and below, also all more sharply defined or contrasted below. First dark band through eye from occiput, but not wider than pupil. Second dark band not reaching pectoral axil but continues down below obliquely back till above ventral base. Some examples also show a dark or dusky variable line, often as dark spots or bars from side of chin back along side of breast and delimiting dark-gray shade above from white below. Caudal peduncle above with short dark bar, very variable. Vertical fins variably olive-gray to dull oil-green, edge of anal broadly white. Pectoral pale or transparent-gray. Ventral white, with soiled, dusky appearance medially. Two, 139 to 164 mm. Honolulu. R. W. Wehrle.

Abundant in Honolulu markets, March 30, 31, April 1, July 19.

Zebrasoma veliferum (Bloch).

Acanthurus velifer Schmeltz: Mus. Godeffroy, Cat. 1, p. 9, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 7, 1865 (South Seas).—Schmeltz: op. cit., 3, p. 10, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 50, 1879 (Society Islands).—Pöhl: op. cit., 10, p. 30, 1884 (South Seas).

Zebrasoma veliferum Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 255, 1929 (New Guinea, Apia, Hawaiian Islands, Honolulu, Rikitea, Tahaa, Samoa).

Acanthurus hypselopterus Pöhl: op. cit., 10, p. 31, 1884 (Pelew Islands).

Generally deep-drab or neutral-gray. Muzzle, chin, and breast paler; all with network of dark, reticulating lines, becoming pale or pearl-gray toward borders of first blackish-brown band from occiput, which, much narrower than eye though wider than pupil, extends down over cheek vertically and broader, then obliquely back to reach ventral bases. Second broader band from front of dorsal, expands below to include hind margin of opercle, all of shoulder girdle, and axillary region of pectoral, then narrows at terminus at vent and behind ventral spine base. Rest of body with four similarly inclined, broad, dark bands, though all much wider at dorsal base than their terminus on anal base; only fourth band much narrower and less extensive than others. Besides these, entire caudal peduncle broadly and contrastedly dark. Along pearly regions of interventing bands each with several variable yellowish lines. Also yellow spots, sometimes confluent as lines and bars vertically, extend over dark areas or bands. Dorsals very dark or slate-black, with obscure paler spots, regular, and become fused as narrow, vertical lines on soft fin posteriorly. Anal like dorsal. Caudal pale or dull olive-gray, darkest medially and terminally. Pectoral dull olive-gray, with more yellowish tint basally. Ventral blackish slate. Iris yellowish-white, except as crossed by narrow, dark vertical band, though area on iris much narrower than dark band. Socket of caudal spur slate black. Two, 188 to 200 mm. Honolulu. R. W. Wehrle.

Larger example with snout, chest, breast, top of head, and first band with fine reticulation of dark lines. First pale vertical band with two gamboge-yellow lines above eye and four below; second dark band with three gamboge-yellow lines; second pale band with two lemon-yellow lines; third broad, dark band with six gamboge-yellow lines, resolving into four on abdomen; third pale band with one or two yellow lines; fourth dark band with four or five gamboge-yellow lines; fifth pale band with one or two lemon-yellow lines; fifth dark band with two or three gamboge-yellow lines; remaining pale bands each with yellow line and two gamboge-yellow lines over sixth dark band. Sometimes yellow lines break as spots, bars, or blotches.

Zebrasoma flavescens (Bennett).

Zebrasoma flavescens Fowler: B. P. Bishop Museum, Mem. 10, p. 274, pl. 32, fig. A, 1928 (Apia, Honolulu, Marcus Island, Raiatea, Laysan, Johnston Island, types of *Zebrasoma agana* Seale).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 258, 1929 (New Guinea, Apia, Tahaa, Puako Bay, Hawaiian islands, Honolulu).

Acanthurus rhombeus Schmeltz: Mus. Godeffroy, Cat. 3, p. 10, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 50, 1879 (South Sea islands).—Pöhl: op. cit., 10, p. 31, 1884 (South Seas).

Zebrasoma rhombeum Fowler: B. P. Bishop Museum, Mem. 10, p. 275, 1928 (New Guinea, Apia, Tahaa, Society Islands).

Acanthurus scopas Schmeltz: op. cit., 2, p. 7, 1865 (South Seas).

As may be seen from the above references *Zebrasoma rhombeum*, the dark form admitted as distinct in my "Fishes of Oceania" is united by Fowler and Bean.

Naso unicornis (Forskål).

Naseus unicornis Schmeltz: Mus. Godeffroy, Cat. 7, p. 50, 1879 (Samoa and Society Islands).

Naso unicornis Herre: Philippine Jour. Science, vol. 34, no. 4, p. 455, pl. 6, fig. 1, text fig. 2, December, 1927 (Honolulu).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 264, fig. 10 (rostral variation) 1929 (Apra Bay on Guam, Honolulu, Samoa, Hilo, Oahu).

Keris maculatus Kner: Wiener Monatsberichte, no. 24, seite 187, 1864 (type loc., South Seas).—(Kner) Schmeltz: Mus. Godeffroy, Cat. 2, p. 7, 1865 (South Seas: no description).

Naseus olivaceus Schmeltz: op. cit., 7, p. 50, 1879 (Tahiti).—Pöhl: op. cit., 10, p. 31, 1884 (Tahiti).

Keris amboinensis Schmeltz: op. cit., 7, p. 50, 1879 (Yap).—Pöhl: op. cit., 10, p. 31, 1884 (Upolu).

Back broccoli-brown, becoming pinkish to cream-buff on abdomen. Iris buff. Head nearly olive-buff above, paler below. Lips gray, edged dusky slate on outer borders. Teeth pale brown. Dorsals nearly ecru-drab on spinous portion to pale-isabella color on soft dorsal posteriorly. Anals cream-olive, with marginal dusky border and two longitudinal pearl-gray to plumbeous bands, little narrower than pale interspaces. Caudal plates neutral-gray. Caudal dull broccoli-brown, more grayish submarginally and hind edge narrowly white. Paired fins pale brown, membranes dusky, spine and rays pale-brown. One, 120 mm. Honolulu. R. W. Wehrle.

Abundant in Honolulu markets, March 29, 30, 31, April 1, 2.

In the Queensland Museum one from Kaewieng, New Ireland, obtained by Dr. J. Jackson.

Naso brevirostris (Valenciennes).

Naseus brevirostris Schmeltz: Mus. Godeffroy, Cat. 7, p. 50, 1879 (Pelew Islands).—Pöhl: op. cit., 10, p. 31, 1884 (Pelew Islands).

Naso brevirostris Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 268, fig. 17 (rostral variation), 1929 (Puako Bay, Honolulu, Hawaii, Rangiroa).

Naso annulatus (Quoy and Gaimard).

Naseus annulatus Schmeltz: Mus. Godeffroy, Cat. 1, p. 9, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 8, 1865 (South Seas).—Pöhl: op. cit., 10, p. 3, 1884 (South Seas).

Naso annulatus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 271, fig. 18 (rostral variation), 1929 (Apia, type of *Acanthurus incipiens*).

Naseus marginatus Schmeltz: op. cit., 7, p. 50, 1879 (Yap).

Naso tuberosus Lacépède.

Naseus tuberosus Pöhl: Mus. Godeffroy, Cat. 9, p. 31, 1884 (South Seas).

Naso tuberosus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 273, fig. 19 (rostral variation), 1929 (New Guinea).

Naso eoume (Lesson).

Naso eoume Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 275, fig. 20 (rostral variation), 1929 (Rangiroa).

Naseus vlamingi Schmeltz: Mus. Godeffroy, Cat. 7, p. 50, 1879 (Ponape and Tahiti).

Naso lituratus (Schneider).

Naseus lituratus Schmeltz: Mus. Godeffroy, Cat. 1, p. 9, 1864 (South Seas).—Schmeltz: op. cit., 3, p. 10, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 50, 1879 (South Seas).—Pöhl: op. cit., 9, p. 31, 1884 (South Seas).

Naso lituratus Herre: Philippine Jour. Science, vol. 34, no. 4, p. 464, pl. 16, fig. 1, December, 1927 (Guam).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 278, 1929 (Johnston Island, Apia, Hawaiian islands).

Callicanthus lituratus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

One example in Honolulu market, March 29.

Naso hexacanthus (Bleeker).

Naso hexacanthus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 280, fig. 21 (rostral variation), 1929 (type of *Callicanthus metoposophron*).

Naso thynnoides (Valenciennes).

Naseus thynnoides Pöhl: Mus. Godeffroy, Cat. 9, p. 31, 1884 (Upolu).

SIGANIDAE

Siganus concatenatus (Valenciennes).

Teuthis concatenata Schmeltz: Mus. Godeffroy, Cat. 7, p. 49, 1879 (South Seas).—Pöhl: op. cit., 10, p. 30, 1884 (Kandavu).

Siganus concatenatus Whitley: Pan-Pacific Inst., Jour., vol. 1, no. 2, p. 6, January-March, 1927 (Fiji).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 293, 1929 (New Guinea).

Siganus albopunctatus (Schlegel).

Teuthis albopunctata Pöhl: Mus. Godeffroy, Cat. 9, p. 30, 1884 (Kanathia).

Siganus albopunctatus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 297, 1929 (compiled).

Siganus vermiculatus (Valenciennes).

Teuthis vermiculatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 49, 1879 (Kandavu).—Pöhl: op. cit., 10, p. 30, 1884 (South Seas).

Siganus rostratus (Valenciennes).

Teuthis rastrata Schmeltz: Mus. Godeffroy, Cat. 7, p. 49, 1879 (Samoa).

Siganus rostratus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 310 (Apia, Mangareva, Kusaie, Paumotus, Fiji).

Teuthis oligosticta Schmeltz: op. cit., 7, p. 49, 1879 (Kanathia).—Pöhl: op. cit., 10, p. 30, 1884 (South Seas).

Siganus canaliculatus (Mungo Park).

Siganus canaliculatus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 311, 1929 (compiled).

Siganus margaritiferus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Siganus punctatus (Schneider).

Siganus punctatus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 312, 1929 (New Guinea and Apia).

Teuthis hexagonatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 6, 1881 (Ponape).

Siganus notostictus (Richardson).

Amphacanthus notostictus Richardson: Ann. Mag. Nat. Hist., London, vol. 11, p. 172, 1853 (type loc., Port Essington).

Teuthis notosticta Schmeltz: Mus. Godeffroy, Cat. 3, p. 10, 1866 (Samoa).

Siganus notostictus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 314, 1929 (compiled).

Siganus stellatus (Forskål).

Amphacanthus Theutis stellatus Schmeltz: Mus. Godeffroy, Cat. 1, p. 9, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 7, 1865 (South Seas).—Pöhl: op. cit., 10, p. 30, 1884 (Ponape).

Teuthis stellata. Schmeltz: op. cit., 3, p. 10, 1866 (Samoa).

Siganus fuscescens (Houttuyn).

Siganus fuscescens Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 314, 1929 (New Guinea, Samoa, Suva).

Siganus argenteus (Quoy and Gaimard).

Teuthis argentea Schmeltz: Mus. Godeffroy, Cat. 3, p. 10, 1866 (Samoa).

Siganus argentea Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 319, 1929 (Fiji).

Siganus lineatus (Valenciennes).

Siganus lineatus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Siganus spinus (Linné)

Siganus spinus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 320, 1929 (Apia and Fiji).

Teuthis striolata Schmeltz: Mus. Godeffroy, Cat. 7, p. 49, 1879 (South Sea).—Pöhl: op. cit., 10, p. 30, 1884 (Kandavu).

Teuthis marmorata Schmeltz: op. cit., 7, p. 49, 1879 (Society Islands).

Siganus rivulatus (Forskål).

Siganus rivulatus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 323, 1929 (compiled).

Teuthis nebulosa Pöhl: Mus. Godeffroy, Cat. 10, p. 30, 1884 (Samoa).

Siganus doliatus (Valenciennes)

Teuthis doliata Schmeltz: Mus. Godeffroy, Cat. 7, p. 49, 1879 (Pelew Islands).—Pöhl: op. cit., 9, p. 30, 1884 (Tahiti).

Siganus doliatus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 8, p. 324, 1929 (New Guinea).

In the Queensland Museum two specimens, 116 to 168 mm. long, from Bau, Fiji, July, 1926.

Siganus puellus (Schlegel).

Teuthis puella Schmeltz: Mus. Godeffroy, Cat. 8, p. 6, 1881 (Ponape).—Pöhl: op. cit., 10, p. 30, 1884 (Ponape).

Siganus vulpinus (Schlegel).

Teuthis vulpina Schmeltz: Mus. Godeffroy, Cat. 8, p. 6, 1881 (Ponape).—Pöhl: op. cit., 10, p. 30, 1884 (Ponape).

Lo vulpinus Jordan: Pan-Pacific Inst., Jour., vol. 2, no. 4, p. 9, October-December, 1927 (Samoa: though possibly Jordan and Seale's Alu, Solomons, record may have been intended ?).

SCORPAENIDAE [6]

Parascorpaena bandanensis (Bleeker).

Scorpaena haplodactylus Schmeltz: Mus. Godeffroy, Cat. 3, p. 8, 1866 (Somoa).—Schmeltz: op. cit., 7, p. 43, 1879 (South Sea islands).

Scorpaenopsis cirrhosus (Thunberg).

Scorpaena cirrhosa Schmeltz: Mus. Godeffroy, Cat. 7, p. 43, 1879 (Huahine, Society Islands).—Pöhl: op. cit., 9, p. 29, 1884 (Huahine).

Scorpaenopsis gibbosus (Schneider).

Scorpaena gibbosa Schmeltz: Mus. Godeffroy, Cat. 7, p. 43, 1879 (Pelew Islands).—Pöhl: op. cit., 9, p. 29, 1884 (Pelew Islands).

Scorpaena diabolus Schmeltz: op. cit., 7, p. 43, 1879 (Viti Islands).—Pöhl: op. cit., 9, p. 29, 1884 (South Seas).—Whitley: Pan-Pacific Inst., Jour., vol. 1, no. 2, p. 6, January-March, 1927 (Fiji).

Scorpaena nesogallica Schmeltz: op. cit., 7, p. 43, 1879 (Society Islands).—Pöhl: op. cit., 9, p. 29, 1884 (Society Islands).

Depth 2 1/2 to 2 3/4; head 2 to 2 1/3, width 2 to 2 1/6. Snout 3 3/5 to 4 in head from snout tip; eye 3 1/5 to 4 1/2, 1 to 1 1/5 in snout, greater than bony interorbital; maxillary reaches nearly opposite or slightly beyond hind eye edge, expansion 1 1/4 to 1 1/3 in eye, length 1 2/3 to 1 3/4 in head from snout tip; teeth villiform, in narrow bands in jaws and across vomer, but none on palatines; bony interorbital 5 to 5 3/4, very deeply concave; preopercle edge with 5 spines, uppermost from ridge of bony stay across cheek which also gives small point at angle of preopercle ridge; 2 spines on lower preorbital edge; supraorbital ridge with small anterior spine, then 2 close together posteriorly; then 3 spines along each side of cranium above; 3 follow from postocular, of which 1 at suprascapula; opercle with 3 spines. Though no nasal spines a small fleshy supraocular flap posteriorly each side. Gill rakers 6 + 8, short points, long as gill filaments or 2 3/4 to 3 in eye.

Tubular scales 18 to 20 in lateral line to caudal base and 1 or 2 more on latter; 5 scales above, 10 below, 4 or 5 predorsal. Head more or less scaly, maxillary naked.

D. XII, 9, 1, fourth spine 2 1/3 to 3 in total head length, second ray 2 to 2 1/4; A. III, 5, 1, second spine 2 1/4 to 2 7/8, second ray 1 7/8 to 2; caudal 1 3/5 to 1 2/3, convex behind; least depth of caudal 3 1/3 to 3 2/5; pectoral 1 1/2 to 1 2/3; ventral 1 3/5 to 1 2/3.

Generally pinkish-vinaceous above, with geranium-pink, rose-pink, and coral-red shades, variegated with lavender tints on flanks. Tentacles on head all more or less pink or rosy. Sepia band from lower eye edge down over cheek to gill opening, another from postocular parallel and often dark vertical line anteriorly on preorbital. Sides of head and under surface mottled with sepia, variously dark or dusky; also with minute whitish dots or specks scattered about, especially along maxillary; region of isthmus more neutral-dusky. Usually vertical dusky shade from hind dorsal spines to vent and another from soft rays to front of anal. Trunk and tail all variably dusted with various shades of dusky, over which scattered minute white dots or specks. Vertical fins pale-pink; spinous dorsal geranium-pink with few dusky markings; soft dorsal base pink, membranes terminally whitish and rays often mottled more or less with dusky; anal like soft dorsal; caudal bright coral-red to geranium-pink, medially dull-yellowish and terminally neutral-gray, brown, or dusky-slate. Paired fins neutral or slate-black basally, terminally pale, also lower pectoral rays basally and ventral bases entirely more or less white; in dark areas on paired fins minute whitish dots or specks scattered closely over fin. Iris rose to pink or orange. Fifteen examples 33 to 40 mm. Honolulu. R. W. Wehrle.

Although quite variable in details of coloration the young of this species is easily distinguished from the brown *Sebastapistes albobrunneus* and *S. asperella* in its rosy coloration.

Sebastapistes albobrunneus (Günther).

Scorpaena alba brunnea Pöhl: Mus. Godeffroy, Cat. 9, p. 29, 1884 (Pelew Islands).

Sebastapistes galactacma Whitley: Pan-Pacific Inst., Jour., vol. 1, no. 2, p. 6, January-March, 1927 (Fiji).

Body generally pale-olive above, becomes somewhat olive-yellow laterally and still paler to whitish on under surface of head, breast, chest, and belly. Head like back, often dusky or deep neutral-gray on under surface with age. Lips gray. Entire upper and lateral surface of head closely spotted with sepia, all spots greatly smaller than pupil. Also similar spots closely set all over trunk and tail above, variably more sparse in some specimens, also greatly crowded more or less over all fins. In small examples dark spots all more or less inconspicuous or absent from soft verticals and paired fins terminally. On trunk and tail general color often with inconspicuous transverse dark band on former and another from soft dorsal to anal; in young, latter often quite conspicuous. Often lower portions of pectorals, most of ventrals, and anals tinged with rose-pink. Caudal fin often with brown subbasal transverse band and neutral-gray transverse terminal band. Iris variably with pink or rosy ring around pupil, then outer area yellowish. Pectoral axil variably or not dotted closely with dusky. Twenty specimens, 26 to 60 mm. Honolulu. R. W. Wehrle.

Easily distinguished by its finely dark-dotted color pattern.

In Bishop Museum, 4 from Suva, Fiji, 28 to 45 mm. long, obtained by Dr. H. L. Ladd on June 10, 1926.

Sebastapistes asperella (Bennett).

Head above dusky-brown, olive or gray, often with lilac, pink, or vinaceous to orange-buff tints. Under surface of head white, often pink, on mandible. Iris pink or vinaceous pink. Cheek and side of head variably dusky to olive, sometimes as blackish blotch on cheek below, another just below hind eye edge and third on opercle below. Back pale-brown, under surface of trunk and tail buff; above and on sides various sepia to olive cloudings, often with pearl-white blotches, spots or specks scattered irregularly. Vertical fins all pale gray. Large deep-gray blotch on spinous dorsal fin medially and slate-back marginal blotch large as eye. Soft vertical fins all blotched with dusky or slate-black; as three irregular transverse bands on soft dorsal, often slate-black blotch at base of fin medially; two dark blotches on anal and three as

[6] *Scorpaena cruenta* Richardson is noted by Schmeltz: Mus. Godeffroy, Cat. 7, p. 43, 1879 (South Seas).

Scorpaena militaris Richardson is also noted by Schmeltz: op. cit., 2, p. 6, 1865 (South Seas).

Both these are extralimital and are not properly established in Oceania.

transverse bands on caudal. Pectoral olive on rays, upper with several dark spots on each terminally and lower basal portion of fin largely dusky-olive; axil and outer pectoral region often with some vinaceous blotches. Ventrals, salmon color basally, outer portions of membranes dusky, rays olivaceous. Seven specimens, 32 to 76 mm. Honolulu. R. W. Wehrle.

Sebastapistes bynoensis (Richardson).

Scorpaena bynoensis Schmeltz: Mus. Godeffroy, Cat. 7, p. 43, 1879 (Rarotonga).

Sebastapistes zanzibarensis (Playfair).

Scorpaena zanzibarensis Schmeltz: Mus. Godeffroy, Cat. 7, p. 43, 1879 (Viti Islands).

Scorpaenodes guamensis (Quoy and Gaimard).

Scorpaena guamensis Schmeltz: Mus. Godeffroy, Cat. 7, p. 43, 1879 (South Sea Islands).

Sebastes polylepis Pöhl: op. cit., 9, p. 29, 1884 (Samoa).

Two in Bishop Museum, 48 to 58 mm. long from Suva, Fiji, obtained June 10, 1926, by Dr. H. L. Ladd. Found under coral heads, near shore.

Scorpaenodes scabra (Ramsay and Ogilby).

Three in the Bishop Museum 52 to 80 mm. long from Suva, obtained June, 1926, by Dr. Ladd. Also one 93 mm. with same data. All have flaps on head and maxillary with small scales.

Merinthe macrocephala (Sauvage).

Depth 2 7/8 to 3; head 2, width 2 2/3 to 2 7/8. Snout 3 1/3 to 3 2/5 in head from snout tip; eye 4 1/3 to 4 2/3, 1 1/5 to 1 2/5 in snout, greatly more than interorbital; maxillary reaches middle of eye, expansion 1 3/5 to 1 3/4 in eye, length 2 1/4 in head from snout tip; broad bands of finely villiform teeth in jaws, on vomer and palatines; interorbital 2 1/3 to 3 in eye, concave; pair of small spines well above nostrils; supraorbital ridge with strong anterior spine, 3 upper posteriorly graduated larger backward, then two more each side of occiput; strong postocular spine, also one at suprascapula; suborbital stay with 3 or 4 spines followed by two more from preopercle, on lower edge of which two more pointing downward; opercle with 2 strong flat spines. Gill rakers 8 + 13, lanceolate; gill filaments 3/5 of gill rakers which 2 1/2 in eye; 4 or 5 upper and lower gill rakers as rudiments.

Scales 50 to 52 along close above lateral line to caudal base and 4 or 5 more on latter; tubular scales 25 or 26 in lateral line to caudal base and 2 more on latter; 8 to 10 scales above lateral line, 13 or 14 below, 14 or 15 predorsal to occiput and 12 to 14 more forward opposite hind pupil edge in interorbital. Scales with 14 or 15 basal radiating striae; 46 to 58 apical denticles; circuli fine.

D. XII, 10, 1, fourth spine 3 3/5 to 4 1/4 in total head length, third ray 2 4/5 to 3; A. III, 5, 1, second spine 3 1/2, second ray 2 3/5 to 2 3/4; caudal 2 to 2 1/8, truncate, hind edge little convex as expanded; least depth of caudal peduncle 5 to 5 1/5; pectoral 1 3/4 to 1 4/5; ventral 2 to 2 1/8.

Back with burnt-carmine tinge or mottled with paler, olive-green, yellowish, and dusky. Upper surface of head like back, with lemon-yellow blotches or streaks in sculpturing before, below, and behind eye, also on cheek. Lips orange to scarlet, symphysis of mandible bright-crimson. Lower sides of head with orange and orange-vermilion shades and under surface salmon-pink to whitish. Iris orange and red, with neutral-dusky. Trunk and tail mottled with scarlet, whitish, pinkish and geranium-pink, below more whitish. Rose-purple shade about prepectoral region. Dorsals rose-pink, mottled with dusky slate-black, crimson and olive on spinous fin. Soft dorsal, anal and caudal pink, with rose shades, blotched or spotted with scarlet on fin rays. Paired fins similar, spots rather large on pectoral, though only few and terminal on ventral. Inside mouth and pharynx rose-pink. Two, 258 to 280 mm. Honolulu. R. W. Wehrle.

Three in Honolulu markets, March 30.

Pterois volitans (Linné).

Pterois volitans Schmeltz: Mus. Godeffroy, Cat. 3, p. 8, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 43, 1879 (Samoa).—Whitley: Pan-Pacific Inst., Jour., vol. 2, no. 1, p. 8, January-March, 1927 (Tanna Island, New Hebrides).—Whitley: op. cit., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Pterois antennata (Bloch).

Pterois antennata Schmeltz: Mus. Godeffroy, Cat. 7, p. 43, 1879 (Futuna).

Pterois radiata Cuvier.

Pterois radiata Schmeltz: Mus. Godeffroy, Cat. 7, p. 43, 1879 (South Sea Islands).

Pterois cincta Schmeltz: op. cit., 3, p. 8, 1866 (Samoa).—Pöhl: op. cit. 9, p. 29, 1884 (Samoa).

Dendrochirus zebra (Quoy and Gaimard).

Pterois zebra Schmeltz: Mus. Godeffroy, Cat. 1, p. 8, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 6, 1865 (South Seas).—Schmeltz: op. cit., 3, p. 8, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 43, 1879 (Samoa and Viti Levu).—Pöhl: op. cit., 9, p. 29, 1884 (South Seas).

Dendrochirus brachypterus (Cuvier).

Pterois brachyptera Schmeltz: Mus. Godeffroy, Cat. 7, p. 48, 1879 (Kandavu).—Schmeltz: op. cit., 8, p. 5, 1881 (Kandavu).—Pöhl: op. cit., 9, p. 29, 1884 (Kandavu), p. 45 (New Guinea).

In Bishop Museum, two 73 to 82 mm. from Kona, Hawaii, obtained by W. G. Anderson.

Taenianotus triacanthus Lacépède.

Taenianotus triacantus Schmeltz: Mus. Godeffroy, Cat. 2, p. 6, 1865 (Samoa).

Taenianotus triacanthus Pöhl: op. cit., 9, p. 29, 1884 (Kandavu).—Whitley: Pan-Pacific Inst., Jour., vol. 1, no. 2, p. 6, January-March, 1927 (Fiji).

Gymnapistus vestitus (De Vis).

Type of *Tetraroge vestitus* De Vis, no. 1597, in the Queensland Museum. South Seas. Captain Browne. Length, 75 mm.

Synanceja verrucosa Schneider.

Synanceia verrucosa Schmeltz: Mus. Godeffroy, Cat. 3, p. 8, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 43, 1879 (South Sea Islands).

Synanceia brachio Schmeltz: op. cit., 1, p. 8, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 6, 1865 (Samoa).

Pelor didactylum (Pallas).

Pelor didactylum Schmeltz: Mus. Godeffroy, Cat. 8, p. 5, 1881 (New Britain).

CARACANTHIDAE

Caracanthus maculatus (Gray).

Micropus maculatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 43, 1879 (Tahiti).—Pöhl: op. cit., 10, p. 30, 1884 (Tahiti).

Caracanthus maculatus Jordan: Pan-Pacific Inst., Jour., vol. 2, no. 4, p. 10, October-December, 1927 (Samoa).

Back olive to sepia, becoming drab on sides of body and ecru-drab on under surface of body. Whole upper surface marked with numerous, close-set, saturn-red spots, likewise upper surface of head, where spots larger, more close-set and brilliant. Saturn-red spots also extend over spinous dorsal, bases of soft dorsal, caudal, and pectoral, also prepectoral region and cheek, though smaller in last places and low down on sides of body. General color of head like rest of body, though chest, breast, and under surface of abdomen palest regions. Iris very pale or primrose-yellow, with some slate-gray or dusky spots above. Vertical fins all brown like body color, become mouse-gray to olivaceous terminally, with edges of all soft verticals narrowly gray-white. Ventral pale like belly. Twenty-five, 24 to 46 mm. Honolulu. R. W. Wehrle.

Small specimens differ only in fewer and larger orange spots.

Caracanthus unipinna (Gray).

Micropus unipinna Schmeltz: Mus. Godeffroy, Cat. 7, p. 43, 1879 (Bonham Island).—Pöhl: op. cit., 10, p. 30, 1884 (Viti).

Caracanthus (Amphiprionichthys) unipinna Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

PLATYCEPHALIDAE

Thysanophrys crocodilus (Tilesius).

Platycephalus crocodilus Schmeltz: Mus. Godeffroy, Cat. 7, p. 44, 1879 (Pelew Islands).

Platycephalus punctatus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Thysanophrys japonicus (Tilesius).

Platycephalus japonicus Pöhl: Mus. Godeffroy, Cat. 10, p. 32, 1884 (Samoa).

Thysanophrys variolosus (Günther).

Platycephalus variolosus Schmeltz: Mus. Godeffroy, Cat. 7, p. 43, 1879 (Samoa).

TRIGLIDAE

Chelidonichthys kumu (Cuvier).

Trigla kumu Schmeltz: Mus. Godeffroy, Cat. 2, p. 6, 1865 (South Seas).—Schmeltz: op. cit., 3, p. 8, 1866 (South Seas).—Schmeltz: op. cit., 7, p. 44, 1879 (South Seas).—Pöhl: op. cit., 10, p. 32, 1884 (South Seas).

?Trigla cuculus (non Linné) Pöhl: op. cit., 9, p. 32, 1884 (South Seas).

CEPHALACANTHIDAE

Dactyloptena orientalis (Cuvier).

Dactylopterus orientalis Schmeltz: Mus. Godeffroy, Cat. 7, p. 44, 1879 (Tonga Islands).—Pöhl: op. cit., 9, p. 32, 1884 (Tonga).

Four in Honolulu markets, March 29.

ABUDEFDUFIDAE (=POMACENTRIDAE)[7]

Premnas biaculeatus (Bloch).

Premnas biaculeatus Pöhl: Mus. Godeffroy, Cat. 8, p. 6, 1881 (New Britain Archipelago).

[7] *Geophagus olfersi* Müller and Troschel is erroneously referred to by Schmeltz: Mus. Godeffroy, Cat. 1, p. 8, 1864 (South Seas).

Amphiprion ephippium (Bloch).

Amphiprion ephippium Pöhl: Mus. Godeffroy, Cat. 9, p. 35, 1884 (Ponape).

Amphiprion tricolor Schmeltz: op. cit., 7, p. 51, 1879 (South Seas).—Pöhl: op. cit., 9, p. 35, 1884 (Viti).

In the Queensland Museum, no. 2688, type of *Amphiprion arion* De Vis. South Seas. C. F. Browne.

Amphiprion polymnus (Linné).

Amphiprion polymnus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 7, p. 6, April 17, 1928 (Suva).

Amphiprion clarkii Schmeltz: Mus. Godeffroy, Cat. 7, p. 51, 1879 (Kandavu).—Pöhl: op. cit., 9, p. 35, 1884 (Kandavu).

Amphiprion clarkii var. *chrysargurus* Schmeltz: op. cit., 7, p. 51, 1879 (Kandavu).

Amphiprion clarkii var. *chrysargyrus* Pöhl: op. cit., 9, p. 35, 1884 (Viti).

Amphiprion bicinctus Rüppell.

Amphiprion bicinctus Whitley: Pan-Pacific Inst., Jour., vol. 1, no. 2, p. 6, January-March, 1927 (Fiji).

Amphiprion melanopus Bleeker.

Amphiprion melanopus Schmeltz: Mus. Godeffroy, Cat. 3, p. 10, 1866 (South Seas).—Schmeltz: op. cit., 7, p. 51, 1879 (South Seas).—Pöhl: op. cit., 9, p. 35, 1884 (South Seas).

One 60 mm. long in the Bishop Museum, obtained at Guam by Lieut. H. Hornbostel in 1926.

Amphiprion sebae Bleeker.

One example 28 mm. long from Guam, obtained by Lieut H. Hornbostel in 1926, in the Bishop Museum. It differs a little from Bleeker's figure, as the white caudal is well convex behind and there is a third white blotch or saddle on the caudal peduncle above behind soft dorsal.

Amphiprion percula (Lacépède).

Amphiprion percula Schmeltz: Mus. Godeffroy, Cat. 7, p. 51, 1879 (Pelew Islands).—Pöhl: op. cit., 9, p. 35, 1884 (Kandavu).—Whitley: Pan-Pacific Inst., Jour., vol. 1, no. 2, p. 6, January-March, 1927 (Fiji).—Whitley: op. cit., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Dascyllus trimaculatus (Rüppell).

Dascyllus trimaculatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 51, 1879 (Yap).—Pöhl: op. cit., 9, p. 35, 1884 (Yap).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 7, p. 14, April 17, 1928 (Hawaiian Islands, Samoa, Honolulu, Jaluit, types of *Dascyllus albisella*).

Smoke-gray generally, each scale with clove-brown to bister, edge forming reticulated pattern. At summit of arch of lateral line each scale along course of same with general color pearl-white, this area also extending two scales above and one below lateral line. Iris neutral-gray. Vertical fins and ventrals all seal-brown terminally, paler basally. Pectoral hair brown. Two, 108 to 118 mm. Honolulu. R. W. Wehrle.

Eight young examples, same data as above, with head and body generally gray to gray-white, darker usually on head above and predorsal. Edge of each scale, both on head, body and fins dark sepia or dusky. On lateral line opposite posterior half of depressed pectoral variable,

large pearl-white blotch, its horizontal diameter 6 or 7 scale widths and vertically 6 or 7 scale widths below lateral line besides above to end of squamous region on base of spinous dorsal. White blotch quite variable and often reflected as obscure white blotch of variable size at vent or before anal. In very young it appears as broad white blotch or band from base of spinous dorsal posteriorly down to vent. Vertical fins and ventral, all neutral or slate-black; pearly basal scales on verticals as small white spots. Pectoral pale or transparent-grayish, with small blackish spot at origin. Iris dark olive-gray, narrow golden circle around pupil. Length, 15 to 54 mm.

One in the Bishop Museum from Pearl and Hermes Reef, April, 1927, obtained by T. Dranga.

Dascyllus marginatus (Rüppell).

Dascyllus marginatus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 7, p. 17, April 17, 1928 (Hawaiian islands).

Dascyllus xanthosoma Schmeltz: Mus. Godeffroy, Cat. 7, p. 51, 1879 (Ponape).—Pöhl: op. cit., 9, p. 35, 1884 (Ponape).

Dascyllus melanurus Bleeker.

Dascyllus melanurus Schmeltz: Mus. Godeffroy, Cat. 7, p. 51, 1879 (Yap).—Pöhl: op. cit., 9, p. 35, 1884 (Ponape).

In the Queensland Museum 6 specimens 50 mm. long from the Duke of York Island, obtained from the Australian Museum. Also in Queensland Museum type of *Pomacentrus onyx* De Vis, no. 99. South Seas. Length, 44 mm. Capt. Browne.

Dascyllus aruanus (Linné).

Dascyllus aruanus Schmeltz: Mus. Godeffroy, Cat. 1, p. 8, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 9, 1865 (South Seas).—Schmeltz: op. cit., 3, p. 10, 1866 (Samoa).—Pöhl: op. cit., 9, p. 35, 1884 (South Seas), p. 45 (New Guinea).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 7, p. 21, April 17, 1928 (Samoa, New Guinea, Tahiti, Apia, Mangareva, Fakarava, Pago Pago).

Homalogrystes Alleyne and Macleay is placed with *Acanthochromis* Gill by Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 7, p. 27, 1928, but its genotype *Homalogrystes güntheri* Alleyne and Macleay, is a synonym of *Serranus summana* (Forskål), rather than of *Serranus tauvina* (Forskål), as suggested in my "Fishes of Oceania." In the same reference by Fowler and Bean the citation for *Dascyllus polyacanthus* should have been on page 503 with Batjan as the type locality.

Chromis ternatensis (Bleeker).

Chromis ternatensis Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 13, January-March, 1928 (Santa Cruz Islands).

Chromis dimidiatus (Klunzinger).

Chromis dimidiatus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 7, p. 45, April 17, 1928 (type of *Chromis leucurus* and *Chromis iomelas*; Pago Pago).

Chromis caeruleus (Cuvier).

Chromis caeruleus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 7, p. 61, April 17, 1928 (Tari Tari, Samoa, Fiji, Mangareva, Kusaie, Pago Pago).

Heliastes lepidurus Schmeltz: Mus. Godeffroy, Cat. 3, p. 10, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 52, 1879 South Seas).—Pöhl: op. cit., 9, p. 35, 1884 (South Seas).

One in Bishop Museum from Guam, 53 mm. long, obtained by Lieut. Hornbostel.

Chromis velox Jenkins.

Six in Honolulu markets, March 31. Replaces *Chromis ovalis* as used in the "Fishes of Oceania," as *Heliastes ovalis* Steindachner preoccupied.

Chromis verater Jordan and Metz.

Dark drab-gray to smoke-gray generally, with olive tints on sides medianly. Iris yellowish, with neutral-gray tints above. Vertical fins and ventrals slate-black, paler to neutral-gray basally. Pectoral gray, axil and outer base slate-black, in strong contrast. Length 137 mm. Honolulu. R. W. Wehrle.

Adult in Honolulu market, March 31.

Pomacentrus pavo (Bloch).

Pomacentrus pavo Schmeltz: Mus. Godeffroy, Cat. 2, p. 9, 1865 (South Seas).—Schmeltz: op. cit., 7, p. 51, 1879 (South Seas).—Pöhl: op. cit., 9, p. 35, 1884 (South Seas).—Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 7, April 17, 1928 (Apia and Tari Tari).

Pomacentrus melanopterus Bleeker.

Pomacentrus melanopterus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 7, p. 80, April 17, 1928 (Samoa, Apia, Pago Pago).

In the Queensland Museum, two examples 56 mm. long from the South Seas, obtained by Captain Eastlake.

Pomacentrus tripunctatus Cuvier.

Pomacentrus tripunctatus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 7, p. 89, April 17, 1928 (Apra Bay, Guam).—Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, October-December, 1928 (Santa Cruz Islands).

Pomacentrus vanicolensis Whitley: op. cit., vol. 3, no. 1, p. 12, October-December, 1928 (Santa Cruz Islands).

Pomacentrus notophthalmus Bleeker.

Pomacentrus melanotus Schmeltz: Mus. Godeffroy, Cat. 2, p. 9, 1865 (South Seas).—Schmeltz: op. cit., 3, p. 10, 1866 (Samoa).

Pomacentrus lividus (Schneider).

Pomacentrus lividus Schmeltz: Mus. Godeffroy, Cat. 8, p. 6, 1881 (Ponape).—Pöhl: op. cit., 9, p. 35, 1884 (Ponape).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 7, p. 116, April 17, 1928 (Apia, Kusaie, Samoa).

Glyphisodon cyanospilus Schmeltz: op. cit., 2, p. 9, 1865 (Samoa).

Glyphidodon cyanospilus Pöhl: op. cit., 9, p. 35, 1884 (Samoa).

Pomacentrus cyanospilus Schmeltz: op. cit., 3, p. 10,

1866 (Samoa).—Schmeltz: op. cit., 7, p. 52, 1879 (Samoa).

In Bishop Museum, 2 from Suva, Fiji, 93 or 94 mm. long, obtained by Dr. H. L. Ladd in 1926. Both have a dusky blotch at the pectoral origin and another at bases of last dorsal rays.

Pomacentrus nigricans (Lacépède).

Pomacentrus nigricans Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 7, p. 118, April 17, 1928 (Midway Island, Apra Bay on Guam, Samoa, Makemo, Oahu, Pago Pago).

Pomacentrus scolopsis Schmeltz: Mus. Godeffroy, Cat. 3, p. 10, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 52, 1879 (South Seas).—Pöhl: op. cit., 9, p. 35, 1884 (South Seas).

Pomacentrus bifasciatus Bleeker.

Pomacentrus bifasciatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 51, 1879 (Boston Island).

Pomacentrus inornatus De Vis.

In the Queensland Museum type of *Pomacentrus niomatus* De Vis, no. 111. South Seas. Length, 56 mm. Captain Eastlake.

Abudefduf saxatilis (Linné).

Abudefduf saxatilis Fowler and Bean: U. S. Nat. Mus., Bull. no. 100, vol. 7, April 17, 1928 (Apia, Mangareva, Fakarava).

Glyphidodon coelestinus var. *waigiensis* Schmeltz: Mus. Godeffroy, Cat. 3, p. 10, 1866 (Samoa).

Glyphidodon waigiensis Schmeltz: op. cit., 7, p. 52, 1879 (Samoa).

Abudefduf abdominalis (Quoy and Gaimard).

Generally olive-yellow, becoming whitish below. Iris neutral-gray. Five dark or neutral-slate vertical bands, much narrower than pale interspaces, all becoming much paler below. Dorsals and anals dull olive-yellow, grayish terminally. Anals similar. Caudal and pectoral cream-buff, former with grayish marginally, latter with blackish axillary blotch. Ventral slaty terminally, pale or whitish basally. Two, 119 to 155 mm. Honolulu. R. W. Wehrle.

Abundant in Honolulu markets, March 29, 30; four, July 19.

Abudefduf bengalensis (Bloch).

Glyphisodon bengalensis Schmeltz: Mus. Godeffroy, Cat. 2, p. 9, 1865 (Samoa).—Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Island).

Glyphidodon bengalensis Schmeltz: op. cit., 3, p. 10, 1866 (Samoa).

Abudefduf sexfasciatus (Lacépède).

Abudefduf sexfasciatus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 7, p. 129, April 17, 1928 (Apia, Papeete, Fakarava, Pago Pago).

Glyphidodon coelestinus Schmeltz: Mus. Godeffroy, Cat. 7, p. 52, 1879 (Samoa).—Pöhl: op. cit., 9, p. 35, 1884 (Samoa).

Abudefduf sordidus (Forskål).

Glyphisodon sordidus Schmeltz: Mus. Godeffroy, Cat. 7, p. 52, 1879 (Huahine).—Pöhl: op. cit., 9, p. 35, 1884 (Huahine).

Abudefduf sordidus Fowler and Bean: U. S. Nat. Mus., Bull. no. 100, vol. 7, p. 132, April 17, 1928 (Fanning Islands, Apia, Honolulu, Laysan, Mangareva, Rikatea, Fakarava, Makatea, Oahu, Hawaiian Islands, Maui).

Abudefduf septemfasciatus (Cuvier).

Glyphidodon septemfasciatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 52, 1879 (Savaii).

Glyphidodon 7-fasciatus Pöhl: op. cit., 9, p. 35, 1884 (Savaii).

Glyphisodon septemfasciatus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Abudefduf septemfasciatus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 7, p. 135, April 17, 1928 (Fanning Islands, Apia, Makemo, Tari Tari, Makatea).

Abudefduf curacao (Bloch).

Abudefduf curacao Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 7, p. 138, April 17, 1928 (Apia, Jaluit).

Glyphidodon trifasciatus Pöhl: Mus. Godeffroy, Cat. 9, p. 35, 1884 (Mortlock Island).

Abudefduf unimaculatus (Cuvier).

Abudefduf unimaculatis Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 7, p. 145, April 17, 1928 (Samoa).

Abudefduf dickii (Lienard).

Glyphidodon dickii Pöhl: Mus. Godeffroy, Cat. 9, p. 35, 1884 (Ponape).

Abudefduf dickii Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 17, 1928 (Apia).

Glyphidodon unifasciatus (Kner) Schmeltz: Mus. Godeffroy, Cat. 3, p. 10, 1866 (Samoa; no description).—Schmeltz: op. cit., 7, p. 52, 1879 (Samoa).—Pöhl: op. cit., 9, p. 35, 1884 (Samoa).

Abudefduf leucozonus (Bleeker).

Glyphisodon leucozona Whitley: Pan-Pacific Inst., Jour., vol 1, no. 2, January-March, 1927 (Fiji).

Abudefduf lacrymatus (Quoy and Gaimard).

Glyphidodon lacrymatus Schmeltz: Mus. Godeffroy, Cat. 3, p. 10, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 52, 1879 (South Seas).—Pöhl: op. cit., 9, p. 35, 1884 (South Seas).

In Bishop Museum young specimen 28 mm. long from Guam, obtained by Lieut. H. Hornbostel in 1926.

Abudefduf biocellatus (Quoy and Gaimard).

Abudefduf biocellatus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 7, p. 166, April 17, 1928 (Samoa, Apia, Arhno, Makemo).

Glyphidodon antjerius Schmeltz: Mus. Godeffroy, Cat. 3, p. 10, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 52, 1879 (Samoa).—Pöhl: op. cit., 9, p. 35, 1884 (Samoa).

Glyphisodon antjerius Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Glyphisodon hemimelas Schmeltz: op. cit., 7, p. 52, 1879 (Kanathia).

Abudefduf cyaneus (Quoy and Gaimard).

Abudefduf cyaneus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 7, p. 168, April 17, 1928 (types of *Abudefduf taupou*).

Glyphidodon azureus Schmeltz: Mus. Godeffroy, Cat. 3, p. 10, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 52, 1879 (Samoa).—Pöhl: op. cit., 9, p. 35, 1884 (Samoa).

Abudefduf glaucus (Cuvier).

Abudefduf glaucus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 7, p. 169, April 17, 1928 (Apia, Mangareva, Makatea, Fakarava, Pago Pago).

Glyphisodon modestus Schmeltz: Mus. Godeffroy, Cat. 2, p. 9, 1865 (Mac Kean Island, Phoenix Group).

Glyphidodon modestus Schmeltz: Mus. Godeffroy, Cat. 3, p. 10, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 52, 1879 (Samoa).

Abudefduf leucopomus (Cuvier).

Glyphidodon leucopoma Schmeltz: Mus. Godeffroy, Cat. 7, p. 52, 1879 (Samoa).

Abudefduf uniocellatus (Quoy and Gaimard).

Glyphidodon uniocellatus Schmeltz: Mus. Godeffroy, Cat. 3, p. 10, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 52, 1879 (Samoa).—Pöhl: op. cit., 9, p. 35, 1884 (Samoa).

Glyphidodon unicellatus Pöhl: op. cit., 9, p. 35, 1884 (Samoa).

Glyphisodon uniocellatus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Abudefduf uniocellatus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 7, p. 173, April 17, 1928 (Samoa, Apia).

Glyphidodon assimilis Schmeltz: Mus. Godeffroy, Cat. 7, p. 52, 1879 (Viti and Samoa).—Pöhl: op. cit., 9, p. 35, 1884 (Samoa).

In Bishop Museum one 28 mm. long from Suva, Fiji, obtained by Dr. H. L. Ladd on June 10, 1926, from under old coral blocks.

Abudefduf amabilis (De Vis).

Glyphisodon amabilis Whitley: Pan-Pacific Inst., Jour., vol. 1, no. 2, p. 6, January-March, 1927 (Fiji).

Abudefduf amabilis Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 7, p. 177, April 17, 1928 (Apia).

In Bishop Museum 5 from Suva, Fiji, obtained by Dr. H. L. Ladd. June, 1926. Length, 38 to 64 mm.

Abudefduf albofasciatus (Hombron and Jacquinot).

Glyphidodon albofasciatus Schmeltz: Mus. Godeffroy, Cat. 9, p. 35, 1884 (Viti).

Abudefduf xanthozona (Bleeker).

Glyphidodon xanthozona Schmeltz: Mus. Godeffroy, Cat. 7, p. 52, 1879 (Samoa).—Pöhl: op. cit., 9, p. 35, 1884 (Samoa).

Abudefduf zonatus (Cuvier).

Glyphisodon zonatus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 12, January-March, 1928 (Santa Cruz Islands).

Abudefduf zonatus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 7, p. 179, April 17, 1928 (Apia and Jaluit).

Glyphidodon leucozona (non Bleeker) Schmeltz: Mus. Godeffroy, Cat. 7, p. 52, 1879 (Viti Islands).

Hemiglyphidodon plagiometopon (Bleeker).

Glyphidodon plagiometopon Schmeltz: Mus. Godeffroy, Cat. 3, p. 10, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 52, 1879 (Samoa).

Hemiglyphidodon plagiometopon Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, vol. 7, p. 185, April 17, 1928 (New Guinea).

LABRIDAE

Lepidaplois bilunulatus (Lacépède).

Head and anterior part of body peach blossom-pink, passing to wine-purple on trunk and cadmium-orange on soft vertical fins and caudal peduncle. Upper surface of head and back above burnt-carmine. Large black blotch below last soft dorsal rays and front of caudal peduncle extends down to lateral line for four or five scales. Above eye, claret-brown or maroon narrow streak back toward side of occiput, another, similar and parallel, eminates from above nostrils besides single median band from snout tip. Second maroon band starts from side of snout, passes through eye and runs to shoulder girdle. Third and most distinct dark maroon band begins at maxillary and extends back, including lower edge of eye to suprascapula. Fourth waved and irregular broken maroon band, from mouth angle back and from level with this band lower side of head, spotted and blotched with carmine. On trunk and tail each row of scales longitudinally with narrow bands, above lateral line wider than interspaces, besides parallel with course of lateral line; below lateral line bands, as narrower horizontal lines at scale junctures, become crimson or scarlet, then pinkish below; on caudal peduncle, bands all become deep or flame-scarlet. Spinous dorsal lake-red, with neutral-dusky or slate-black blotch terminally on second and third membranes. Soft dorsal, orange, becoming lemon-yellow marginally. Caudal and anal like soft dorsal, only hind edge of former and broad border of anal, bright lemon-yellow. Pectoral rose-pink. Ventral broadly maroon-purple anteriorly, pale-yellowish on shorter rays. Two, 235 to 239 mm. Honolulu. R. W. Wehrle.

Half-grown specimen in Honolulu market, March 30.

Lepidaplois modestus (Garrett).

One adult in Honolulu markets, March 31, one, April 1, two, April 2.

Epibulus insidiator (Pallas).

Epibulus insidiator Schmeltz: Mus. Godeffroy, Cat. 1, p. 10, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 8, 1865 (South Seas).—Schmeltz: op. cit., 3, p. 11, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 53, 1879 (South Seas).—Pöhl: op. cit., 9, p. 36, 1884 (South Seas).

Labrichthys cyanotaenia Bleeker.

Thysanocheilus ornatus Kner: Wiener Monatsberichte, no. 24, 1864 (type loc., Samoa).—Schmeltz: Mus. Godeffroy, Cat. 2, p. 8, 1865 (Samoa).—Pöhl: op. cit., 9, p. 36, 1884 (Samoa and Tahiti).

Labrichthys cyanotaenia Schmeltz: op. cit., 3, p. 10, 1866 (Samoa).

Labrichthys semifasciatus Rendahl.

Labrichthys smifasciatus Rendahl: Nat. Hist. Juan Fernadez and Easter Island, Skottsberg, vol. 3, Zool. pt. 1, p. 65, 1921 (type loc., Easter Island).

Depth 3 1/10 to 3 1/5; head 2 4/5 to 3. Eye 6 1/3 to 6 3/5 in head, 2 1/5 to 2 3/10 in snout, nearly 1 1/10 in interorbital; 2 upper front canines, 4 lower and hind canine also present. Scales 26 in lateral line, 4 above, 9 below, 8 rows on cheek; dorsal scales extend on fin base. D. XI, 11; A. III, 10; pectoral rays 12, fin 1 3/5 to 1 7/10 in head; ventral I, 5; caudal square truncate, except produced upper and lower lobes; least depth of caudal peduncle 6 3/5 to 6 7/10 in combined body and head to caudal base.

Orange-yellow, sides of head red (carmine?), head above with longitudinal dark-brown bands, which extend on front of head; lowermost band from upper lip, just touches eye and ends with dark semilunar spot at base of opercular flap; second band below incomplete, occupies opercle and ends in dark spot at upper edge of opercular flap; bands number 8 to 10 on each side of head; space occupied by longitudinal bands abruptly limited behind on third and fourth vertical rows of scales; broad dark-brown (purplish?) cross bar at caudal base and between it and striated area of anterior back, 5 triangular dark-brown cross bars; these begin broadly above at dorsal base, except last, which joins its fellow on upper side of

caudal peduncle not reaching below to lateral line; second and third, counted from behind, reach 2 scales below lateral line; fourth, 3 or 4; fifth, 4 to 6 scales below lateral line. Body next to dorsal and caudal bases probably red in life. Narrow dusky line along upper and lower caudal edges and at pectoral base. Dorsal membranes dark between first and third spines, otherwise fins pale-orange yellow as body; very small scattered dark spots on dorsal in type. Length 205 to 222 mm. (Rendahl).

Two examples known. Apparently distinguished by its coloration.

Labroides dimidiatus (Valenciennes).

Labroides dimidiatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 53, 1879 (Viti and Tahiti).—Pöhl: op. cit., 9, p. 36, 1884 (Viti).

Labroides quadrilineatus (Rüppell).

Labroides quadrilineatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 53, 1879 (Savaii).—Pöhl: op. cit., 9, p. 36, 1884 (Savaii).

Anampses cuvier Quoy and Gaimard.

Depth 2 3/5 to 2 4/5; head 2 4/5 to 3 1/2, width 2 2/5 to 2 1/2. Snout 2 2/5 to 3 1/8 in head; eye 6 1/2 to 7, 2 to 2 7/8 in snout, 1 3/4 to 1 4/5 in interorbital; maxillary reaches 1/2 to 2/3 to eye, 3 2/5 to 3 7/8 in head; interorbital 4 1/8 to 4 1/4, convexly elevated. Gill rakers 5 + 11, short points, lanceolate.

Scales 20 to 22 in upper section of lateral line, 5 in lower section to caudal base and 4 to 7 more on latter; 6 or 7 scales above lateral line, 10 or 11 below, 9 or 10 predorsal. Scales with 15 to 22 basal radiating striae; obsolete apical striae 40 to 47; circuli very fine.

D. IX, 12, 1, ninth spine 2 7/8 to 3 1/5 in total head length, first ray 2 1/4 to 2 2/5; A. III, 12, 1, third spine 3 1/3 to 4 1/8, second ray 2 1/8 to 2 1/2; caudal 1 1/3 to 1 1/2, truncate, little convex behind as expanded; least depth of caudal peduncle 1 4/5 to 2 1/8; pectoral 1 2/5 to 2; ventral 1 9/10 to 2.

Upper and median sides of body generally olive-brown, becoming scarlet-vermilion along top of back and on dorsals, also on lower edges of body and anals. Each scale on body with round, pearl-white spot, largest on middle of sides, and becoming very small on edge of back; on belly, breast, and chest formed into longitudinal whitish lines, bars or streaks; on lower sides and under surface of head red intervening streaks break more as round, red spots, larger and with dark-gray ocellating edges or rings on opercular region. Upper surface of head very finely and closely dotted with white. Iris olive-yellow. Dorsals scarlet-red with usually basal row of white spots and three or four longitudinal white lines which may variably break as dots, spots, or bars, especially on soft dorsal; dorsal edges narrowly yellowish, with inconspicuous, dark, submarginal line. Caudal brownish-olive, becoming neutral-dusky behind, only spotted and dotted with white basally and narrow hind border gray-white all around. Anal very brilliant scarlet-red, with rather broad, white, longitudinal basal band and three other narrower ones, often variably broken, but far less so than dorsal. Pectoral yellow, paler below, base broadly brown. Ventral scarlet-vermilion, marked with several very variable longitudinal white lines. Three, 165 to 220 mm. Honolulu. R. W. Wehrle.

My examples in no way show the dark lines on the outer portions of the dorsals as seen in Jordan and Evermann's figure. They differ further in having the narrow pale margin to all the vertical fins, besides the conspicuous large deep, or dusky-brown, basal bar on the pectoral. In alcohol the red fades to orange and the general brown color fades to gray.

Anampses caeruleo-punctatus Rüppell.

Anampses coeruleopunctatus Schmeltz: Mus. Godeffroy, Cat. 2, p. 8, 1865 (Samoa).—Pöhl: op. cit., 9, p. 36, 1884 (Samoa).

Anampses caeruleopunctatus Schmeltz: op. cit., 3, p. 11, 1886 (Samoa).—Schmeltz: op. cit., 9, p. 36, 1884 (Samoa).

Anampses pulcher Rendahl: Nat. Hist. Juan Fernandez and Easter Island, Skottsberg, vol. 3, Zool. pt. 1, p. 65, 1921 (Easter Island).

Stethojulis strigiventer (Bennett).

Stethojulis strigiventer Schmeltz: Mus. Godeffroy, Cat. 7, p. 53, 1879 (Viti Islands).—Pöhl: op. cit., 9, p. 36, 1884 (Viti).

Stethojulis axillaris (Quoy and Gaimard).

Stethojulis axillaris Schmeltz: Mus. Godeffroy, Cat. 3, p. 11, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 53, 1879 (Samoa).—Pöhl: op. cit., 9, p. 36, 1884 (Samoa).

Adult in Honolulu market, March 30.

Stethojulis phekadopleura (Bleeker).

Stethojulis phekadopleura Schmeltz: Mus. Godeffroy, Cat. 7, p. 53, 1879 (Kandavu).—Pöhl: op. cit., 9, p. 36, 1884 (Kandavu).

Stethojulis albovittata (Bonnaterre).

Stethojulis albovittata Schmeltz: Mus. Godeffroy, Cat. 7, p. 53, 1879 (Viti Islands).—Pöhl: op. cit., 9, p. 36, 1884 (Viti).

Stethojulis casturi (Bleeker).

Stethojulis casturi Pöhl: Mus. Godeffroy, Cat. 9, p. 36, 1884 (Ponape).—Jordan: Pan-Pacific Inst., Jour., vol. 2, no. 4, p. 7, October-December, 1927 (Samoa).

Hemigymnus fasciatus (Bloch).

Hemigymnus fasciatus Fowler and Bean. U. S. Nat. Mus., Bull., no. 100, vol. 7, p. 245, April 17, 1928 (Apia).

Hemigymnus melapterus (Bloch).

Hemigymnus melanopterus Schmeltz: Mus. Godeffroy, Cat. 7, p. 53, 1879 (Samoa).—Pöhl: op. cit., 9, p. 36, 1884 (Samoa).

Halichoeres centriquadrus (Lacépède).

Platyglossus hortulanus Schmeltz: Mus. Godeffroy, Cat. 7, p. 53, 1879 (Viti Islands and Tahiti).—Pöhl: op. cit., 9, p. 36, 1884 (Samoa).

Halichoeres scapularis (Bennett).

In the Queensland Museum one of 125 mm. from New Britain.

Halichoeres trimaculatus (Quoy and Gaimard).

Güntheria trimaculata Schmeltz: Mus. Godeffroy, Cat. 2, p. 8, 1865 (Samoa).

Platyglossus trimaculatus Schmeltz: op. cit., 7, p. 53, 1879 (Viti and Samoa Islands).—Pöhl: op. cit., 9, p. 36, 1884 (Viti).

Halichoeres trimaculatus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, January-March, 1928 (Santa Cruz Islands).

In the Queensland Museum one 163 mm. from Santo Esprito, New Hebrides, obtained by Mr. Barry.

One, 43 mm. long from Suva, Fiji, in Bishop Museum. Obtained by Dr. H. L. Ladd in 1926,

from under old coral blocks. Color light-brown generally, with small black spot at front of snout medially above, another at pectoral origin, one on caudal peduncle above lateral lines near caudal base and fourth at caudal base medially.

Halichoeres melanurus (Bleeker).

Platyglossus melanurus Pöhl: Mus. Godeffroy, Cat. 9, p. 36, 1884 (Samoa).

Halichoeres marginatus Rüppell.

Platyglossus marginatus Schmeltz: Mus. Godeffroy, Cat. 3, p. 11, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 54, 1879 (Viti Islands).—Pöhl: op. cit., 9, p. 36, 1884 (South Seas).

Halichoeres notopsis (Valenciennes).

Platyglossus notopsis Schmeltz: Mus. Godeffroy, Cat. 7, p. 54, 1879 (Samoa).—Pöhl: op. cit., 9, p. 36, 1884 (Samoa).

Halichoeres hoevenii (Bleeker).

Platyglossus hoeveni Schmeltz: Mus. Godeffroy, Cat. 7, p. 54, 1879 (Pelew [Palau] Islands).

Halichoeres miniatus (Valenciennes).

Platyglossus miniatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 53, 1879 (Viti Islands).—Pöhl: op. cit., 9, 36, 1884 (Viti).

Halichoeres margaritaceus (Valenciennes).

Halichoeres margaritaceus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 13, January-March, 1928 (Santa Cruz Islands).

Halichoeres pseudominiatus Schmeltz: Mus. Godeffroy, Cat. 2, p. 8, 1865 (Samoa).—Schmeltz: op. cit., 7, p. 53, 1879 (Samoa).—Pöhl: op. cit., 9, p. 36, 1884 (Viti and Samoa).

Platyglossus opercularis Schmeltz: op. cit., 7, p. 54, 1879 (Viti Islands).—Schmeltz: op. cit., 8, p. 7, 1881 (Viti).

Halichoeres nebulosus (Valenciennes).

Platyglossus poecilus Schmeltz: Mus. Godeffroy, Cat. 7, p. 54, 1879 (Samoa).—Pöhl: op. cit., 9, p. 36, 1884 (Samoa).

I may note that *Halichoeres macleayi* Jordan and Seale, should not have been printed with the authors' names in parenthesis in my "Fishes of Oceania."

Halichoeres papilionaceus (Valenciennes).

Halichoeres papilionaceus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 13, January-March, 1928 (Santa Cruz Islands).

Halichoeres binotopsis (Bleeker).

Platyglossus binotopsis Schmeltz: Mus. Godeffroy, Cat. 7, p. 54, 1879 (Kandavu and Pelew [Palau] Islands).

Halichoeres ornatissimus (Garrett).

In Bishop Museum, two from Waikiki, Oahu, January, 1923.

Halichoeres argus (Schneider).

Platyglossus guttatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 54, 1879 (Viti Islands).—Pöhl: op. cit., 9, p. 36, 1884 (Viti).

In Bishop Museum, one 75 mm. long from Suva, Fiji, obtained by Dr. H. L. Ladd in 1826.

Halichoeres chloropterus (Bloch).

Platyglossus chloropterus Schmeltz: Mus. Godeffroy, Cat. 3, p. 11, 1866 (Samoa).

Julis semidecorata Schmeltz: op. cit., 1, p. 10, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 8, 1865 (South Seas).

Macropharyngodon goeffroy (Quoy and Gaimard).

Platyglossus geoffroyii Schmeltz: Mus. Godeffroy, Cat. 3, p. 11, 1866 (Samoa).—Pöhl: op. cit., 9, p. 36, 1884 (Samoa).

Platyglossus geoffroyi Schmeltz: op. cit., 7, p. 53, 1879 (Samoa and Viti Islands).

Leptojulis pardalis Kner.

Leptojulis pardalis Schmeltz: Mus. Godeffroy, Cat. 7, p. 54, 1879 (Viti Islands).

Coris angulata Lacépède.

Coris aygula Schmeltz: Mus. Godeffroy, Cat. 7, p. 54, 1879 (Tahiti).—Pöhl: op. cit., 9, p. 37, 1884 (Tahiti).

Coris ballieui Valliant and Sauvage.

In Honolulu markets, two March 30, one March 31, one April 1.

Coris venusta Vaillant and Sauvage.

Head yellow-ocher to gallstone-yellow. Snout orange-buff with median frontal burnt-carmine band from above snout tip to occiput. Carmine bar from front end of snout laterally till up above and including upper edge of eye, on postocular fork as broad branch to occiput, where, joining its fellow, from median burnt-carmine band to spinous dorsal origin; posteriorly main carmine branch extends back along lateral line to caudal peduncle; its posterior extent rose-purple. Solferino band arches from end of maxillary to lower eye edge, then down over opercle to subopercle; anteriorly it becomes gray, crosses lower chin, sends median streak down over branchiostegal region. Another solferino bands forms loup along each lower side of head, upper branch extends below pectoral base down till behind ventral base. Opercle with large carmine blotch, much larger than eye, with small slate-gray or blue blotch in hind angle of opercular flap, its edge behind narrowly yellow. This blotch reflected on shoulder girdle close above pectoral base as median solferino band back till over anal. Above this band, row of parallel crimson spots, becoming mauve below soft dorsal; below solferino band also parallel becomes mauve and still below another solferino band arches from pectoral axil until horizontal or parallel, likewise mauve opposite paired fins. On tail or between soft dorsal and anal, spots or bands all broken or as oblique, parallel, wide v-shaped series of mauve spots, blotches or bars. Blue-gray or magenta line along breast. Iris orange. Dorsals gamboge-gray, spinous fin neutral-gray on first membrane basally, with median neutral-gray longitudinal band, bordered below by longitudinal carmine line; outer or upper half of fin with two narrow parallel gray lines, which on soft fin gives place to blue-gray blotches, spots, or dots; basally on soft dorsal dark blue-gray spot on each membrane, above which very undulate variable blue-gray band, often broken as spots; both dorsals with narrow dusky marginal line. Anal bright-orange, with broad basal solferino band, leaving yellow-gray blotch behind base of each ray; outer 3/5 to 2/3 of fin with many waved parallel solferino lines, finer terminally, all variable, often broken or interrupted; edge of fin with narrow dusky line. Caudal neutral-dusky terminally, basally scales and rays with dull-brownish. Pectoral olivaceous. Ventral white, spine and longest or first two rays, orange or crimson. Two, 155 to 160 mm. Honolulu. R. W. Wehrle.

Coris flavovittata (Bennett).

Back blackish-brown. Lemon-yellow frontal median band from snout tip to spinous dorsal origin; second one from snout tip forks from median frontal band touching upper eye edge, then posteriorly until opposite middle of soft dorsal and anal; still another and superior band begins behind eye on side of predorsal, extends along upper edge of back, where widening, finally loups around as basal caudal crescent; fourth yellow band, median and axial, extends from middle of maxillary, touches lower eye edge, passes over opercular flap, and finally reaches basal caudal crescent. Iris orange-red, with yellow ring around pupil. Neutral, gray-blue spot in yellow band at angle of opercular flap, with narrow orange submargin behind against narrow yellow edge. Lower surface of head ochraceous-buff, whitish below. Lower half of head and trunk salmon-buff to pinkish-vinaceous, most brilliant along below median yellow band. Dorsals blackish brown, edge narrowly white; first two membranes with large neutral-black blotch, larger than eye, ocellated with grayish; median broad lemon-yellow longitudinal band. Anal claret-brown basally, becoming blackish subterminally, with lower border broadly white and though membranes of last rays basally yellowish-white, hind edge of last ray not white. Caudal lemon-yellow basally, this bordered by large black crescent leaving broad white border all around fin. Pectoral salmon-buff, sub-basally whitish and base narrowly pale-yellow on light-olive scaly base. Ventral whitish, front border broadly pale-orange. Length 260 mm. Honolulu. R. W. Wehrle.

In Honolulu markets, one half grown, March 29, one adult, March 30, four, March 31.

Coris gaimard (Quoy and Gaimard).

Coris gaimardi Schmeltz: Mus. Godeffroy, Cat. 7, p. 54, 1879 (Tahiti).

Coris gaimardii Pöhl: op. cit., 9, p. 37, 1884 (Tahiti).

Coris pulcherrima Schmeltz: op. cit., 7, p. 54, 1879 (Viti and Samoa Islands).—Pöhl: op. cit., 9, p. 37, 1884 (Viti).

Body generally hazel or burnt-sienna anteriorly to neutral-maroon posteriorly; small pale-blue spots with obscure dark borders on trunk and tail, becoming greatly more numerous on tail posteriorly or at caudal base, where very crowded or thickly strewn. Head with muzzle dull-orange, posteriorly head becoming darker; median greenish to purple streak, or row of small blotches which begin on middle of snout. Rose-purple band begins on upper front side of snout, extends along upper eye edge and then continues, often broken as bars or spots to spinous dorsal origin. Second purple band extends broadly over postocular, back over upper part of opercle out to end of opercle flap. Third band arches from above maxillary over cheek, but not quite reaching lower eye edge, then down over lower part of opercle to upper portion of subopercle. Iris orange-rosy. Branchiostegal region, chest and breast very dark-olive, though above on each side pea-green parallel ill-defined band. Dorsals largely bright-orange terminally, basally brown; row of light-blue spots on both fins basally, then median area of fin with many small inconspicuous scattered blue spots or dots; first membrane with median neutral-slate or blackish blotch; fins submarginally with single solferino broad line whole extent and margin made up of light-blue outer border against neutral-black line; sometimes dorsals may have large inconspicuous yellow blotches or the outer submarginal portion may be tawny-olive with second blue line extending throughout area medianly; elongate anterior spinous dorsal point orange. Anals like dorsals but with fewer small blue spots and these inconspicuous and more basal; outer portion of fin also varies in same way. Caudal brilliant lemon-yellow, except dark base which included in description of tail. Pectoral carmine basally, otherwise orange-red; usually carmine streak or bar across brown, scaled base; axil neutral-slate, ringed on body with citron-yellow. Ventral with outer edge narrowly dusky, outer long ray orange and rest of fin carmine. Three, 217 to 250 mm. Honolulu. R. W. Wehrle.

Hologymnosus semidiscus (Lacépède).

Coris annulata Schmeltz: Mus. Godeffroy, Cat. 7, p. 54, 1879 (Viti Islands).—Pöhl: op. cit., 9, p. 37, 1884 (Viti).

Thalassoma quinquevittatus (Lay and Bennett).

Julis günthcri Schmeltz: Mus. Godeffroy, Cat. 3, p. 11, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 54, 1879 (South Seas).—Pöhl: op. cit., 9, p. 36, 1884 (Mortlock).

Thalassoma hardwicke (J. W. Bennett).

Julis dorsalis Schmeltz: Mus. Godeffroy, Cat. 1, p. 10, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 8, 1865 (South Seas).—Schmeltz: op. cit., 7, p. 54, 1879 (South Seas).—Pöhl: op. cit., 9, p. 36, 1884 (South Seas).

One specimen 133 mm. long in the Queensland Museum from the Solomon Islands, obtained by Mr. A. R. Spencer.

Thalassoma lunare (Linné).

Julis lunaris Schmeltz: Mus. Godeffroy, Cat. 7, p. 54, 1879 (Tonga and Apamana Islands).—Pöhl: op. cit., 9, p. 36, 1884 (Tonga).

In the Queensland Museum one 140 mm. long from the Solomon Islands, obtained by Mr. A. R. Spencer.

Thalassoma jansenii (Bleeker).

Julis janscnii Schmeltz: Mus. Godeffroy, Cat. 7, p. 54, 1879 (Viti Islands).—Pöhl: op. cit., 9, p. 36, 1884 (Viti).

Thalassoma umbrostygma (Rüppell).

Julis umbrostygma Rüppell: Neue Wirbelthiere, Fische, p. 11, pl. 3, fig. 2, 1835 (type loc., Mohila; Djedda, Red Sea).

Julis umbrostigma Schmeltz: Mus. Godeffroy, Cat. 7, p. 54, 1879 (Pelew Islands and Tahiti).—Pöhl: op. cit., 9, p. 36, 1884 (Paumoto).

Thalassoma umbrostygma Rendahl: Nat. Hist. Juan Fernandez and Easter Island, Skottsberg, vol. 3, Zool. pt. 1, p. 64, 1921 (Easter Island).

As Rendahl alone noticed, the original spelling of the specific name of this species is as given above.

Thalassoma purpureum (Forskål).

Julis quadricolor Schmeltz: Mus. Godeffroy, Cat. 1, p. 10, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 8, 1865 (South Seas).

Adult in Honolulu market, March 29, and another, March 30.

Thalassoma trilobata (Lacépède).

Julis trilobata Schmeltz: Mus. Godeffroy, Cat. 3, p. 11, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 54, 1879 (Samoa and Tahiti).

Julis trilobatus Pöhl: op. cit., 9, p. 36, 1884 (Samoa).

Back and upper surface of head vinaceous-buff, with heliotrope-purple shades posteriorly. Upper surface of head with olive shades posteriorly, especially on opercle. Iris pinkish-buff. Entire cheek and lower half of head ochraceous-buff to buff-yellow, same shade extending on chest, breast, and belly, also region before and below pectoral. General shade of trunk and tail light wine-purple with reflection of salmon color. Above pectoral some

gamboge-yellow shades. Trunk with two rows of large vertical lozenge-shaped olive-yellow blotches; upper row extends along lateral line and back over upper surface of caudal peduncle; lower row begins at pectoral axil and extends along little below median axis of body; upper row also with four olive-yellow connecting bars to bases of dorsals. Above anal along lower side of tail third greenish-yellow series of blotches, smaller and less perfected, though reaching caudal base. Dorsals with bases narrowly olive-yellow, fin medianly neutral-salmon color, or buff-yellow, subterminally narrow white line and edges of fins narrowly lemon-yellow. Anal basally light-fawn, sharply contrasted with broad white border. Caudal olive-yellow, each ray more olive, though terminally broadly white, also upper and lower edges narrowly white, broadly so terminally. Pectoral lemon-yellow basally, medianly gray-white and terminally neutral-dusky, upper border china-blue. Ventral white, spine salmon color, tip of fin slightly neutral-gray. Two, 230 to 248 mm. Honolulu. R. W. Wehrle.

Six in Honolulu markets, March 31.

Thalassoma lutescens (Lay and Bennett).

In Bishop Museum one 95 mm. long from Waikiki, Oahu, obtained March, 1923.

Thalassoma melanochir (Bleeker).

Julis melanochirus Schmeltz: Mus. Godeffroy, Cat. 2, p. 8, 1865 (Samoa).—Schmeltz: op. cit., 7, p. 54, 1879 (Samoa).

Thalassoma duperrey (Quoy and Gaimard). (fig. 5).

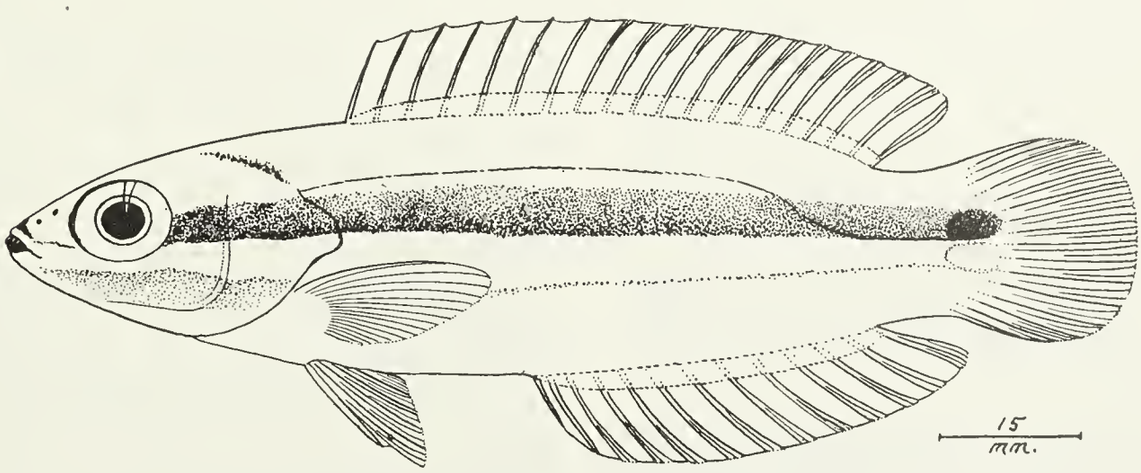


FIGURE 5.—*Thalassoma duperrey* (Quoy and Gaimard). Young.

Head neutral-slate to slate-black. Iris olivaceous, narrow golden ring around pupil. Fore part and greater part of trunk dull orange-buff, extending below to include vent. Hind part of trunk and tail deep-chocolate, each scale with slightly darker vertical line, some appearing as broken or only as small spots. Dorsals basally or over squamous region olive-yellow, with upper bordering shade neutral-olive; median or upper median portion of fin vinaceous; subterminally fin neutral-slate, this color extending over most all of first three membranes. Anal neutral-slate, with dark-vinaceous tinge posteriorly and basally. Caudal with broad marginal hazel band above and below, fin dusky-olive medially, little pale on posterior border. Pectoral largely buff-pink, whitish basally, with broad neutral-black band over terminal part of fin, also narrow neutral-black bar across base of fin. Ventral gray-white, tip neutral-black. Sixteen specimens, 25 to 166 mm. Honolulu. R. W. Wehrle.

Two smallest specimens, 25 to 44 mm., show dark or blackish lateral band dividing olive color of back from yellowish-white of belly. Also parallel alongside pearl-white band, in larger specimen rose-pink. In both, dark band ends in distinct jet-black round blotch at caudal base. Both with iris orange-pink. Fins all pale, verticals largely orange-red basally, with caudal grayish terminally. Paired fins pale-orange. Larger specimens, 47 to 73 mm. long, median-black outer blotch on pectoral has not appeared. Fore part of trunk above scarcely paler than rest of back, though dark and pale longitiudinal lateral bands absent. All show small dark spot at origin of pectoral very distinct and in larger ones at least slaty streak across pectoral base transversely. All with dorsals and anals dark. Caudal broadly orange above and below basally, grayish terminally and medianly, yellowish posteriorly. Paired fins largely buff to orange basally.

Abundant in Honolulu markets, March 29, 30, 31, April 1, July 19.

Thalassoma amblycephalus (Bleeker).

Julis amblycephalus Pöhl: Mus. Godeffroy, Cat. 9, p. 36, 1884 (Mortlock).

Thalassoma ballieui (Vaillant and Sauvage).

Back chocolate to madder-brown; sides and below ecru-brown or drab; isabella color on breast, chest and prepectoral region and under surface of head. Mandible gray. Iris lake-red. Back, flanks, and tail with 46 narrow maroon-purple transverse lines, sometimes variable, narrower than pale interspaces, not on breast, chest, and prepectoral region and on caudal fin basally, giving place to 4 or 5 series of diamond-shaped, maroon blotches on latter, which of dark-neutral tint. Dorsals olivaceous-green, terminally with dusky, soft fin with many fine parallel slightly chocolate lines inclined backward. Anal rose-pink, terminally grayish. Caudal dusky terminally, olive-gray medially. Pectoral greenish. Ventral pale terminally, gray on rays, basally yellowish. Two, 175 to 178 mm. Honolulu. R. W. Wehrle.

Pseudolabrus inscriptus (Richardson).

Labrichthys fuentesi Rendahl: Nat. Hist. Juan Fernandez and Easter Island, Skottsberg, vol. 3, Zool. pt. 1, p. 64, 1921 (Easter Island).

Gomphosus varius Lacépède.

Gomphosus varius Schmeltz: Mus. Godeffroy, Cat. 7, p. 54, 1879 (Samoa and Viti Islands).—Pöhl: op. cit., 9, p. 36, 1884 (Samoa).

Gomphosus pectoralis Whitley: Pan-Pacific Inst., Jour., vol. 2, no. 1, p. 8, January-March, 1927 (Rotuma).

Three in Honolulu markets March 29.

Gomphosus tricolor Quoy and Gaimard.

Gomphosus tricolor Schmeltz: Mus. Godeffroy, Cat. 3, p. 11, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 54, 1879 (South Seas).—Pöhl: op. cit., 9, p. 36, 1884 (South Seas).

Gomphosus cepedianus Schmeltz: op. cit., 2, p. 8, 1865 (Samoa).

Head deep-chocolate, marbled with neutral-black. Lips vinaceous. Iris pinkish-vinaceous. Trunk and tail deep olive-dusky, each scale with narrow claret-brown basal vertical bar or line, inconspicuous on breast, chest, and edges of body as basal round spot to each scale. Broad lemon-yellow blotch at shoulder girdle down to pectoral axil. Dorsals basally olive, with chocolate blotch on each membrane, rest of fin broadly lemon-yellow. Anal with very narrow dusky base, most all of fin bright lemon-yellow. Caudal blackish-olive basally and along upper edges, leaving wide posterior hind area medianly bright lemon-yellow. Pectoral lemon-yellow basally, small black spot at origin also extends on yellow axil, fin terminally neutral-dusky with yellow base separated by oblique china-blue band parallel with hind edge. Ventral gray-white, darker marginally or neutral-dusky. Length, 248 mm. Honolulu. R. W. Wehrle.

Four in Honolulu markets, March 29.

Cheilio inermis (Forskål).

Cheilio inermis Schmeltz: Mus. Godeffroy, Cat. 1, p. 10, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 8, 1865 (South Seas).—Schmeltz: op. cit., 7, p. 54, 1879 (Viti Islands and Tahiti).—Pöhl: op. cit., 9, p. 37, 1884 (Viti). —Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 13, January-March, 1928 (Santa Cruz Islands).

Generally olive on back, paler on sides and whitish on under surface. Each scale on back and sides with slightly darker border than rest of body tinge. Along middle of side of trunk and tail six dusky to blackish blotches, irregular and appearing as row of 3 or 4 close-set small dark spots, one to each scale. Head olive above, sides pale, lower surface white. Lips tinged with yellow. Iris pink. Two longitudinal gray-white streaks on cheek below eye, also several postocular. Dorsals gray-white, with tawny-olive reticulate blotches. Anal similar, little deeper gray terminally and white basally assuming form of spots, blotches or vermiculations, intervening blotches buff. Caudal pale-olive buff, rays dark-olive. Paired fins pale-buff. Length 209 mm. Honolulu. R. W. Wehrle.

Larger specimen, 220 mm., same data, ochraceous-rufous, below orange-ochraceous. On back each scale with gray spot, on lower side and below each scale with larger spot of white so on lower surface of body white predominates. Along middle of side of trunk and tail seven or eight ill-defined neutral or slate-black blotches. On head general color orange-ochraceous, with variable gray longitudinal lines and blotches, becoming white and predominating on under side of head. Iris rose-pink. Lips yellow. Dorsals gray-white, rays olive-buff. Anals similar, rays more pale-yellow. Caudal with membranes whitish basally, rays olive-yellow, median more olive. Paired fins pale buff.

Abundant in Honolulu markets, March 29, 30, 31, April 1, July 19.

Pseudocheilinus hexataenia (Bleeker).

Pseudocheilinus hexataenia Schmeltz: Mus. Godeffroy, Cat. 7, p. 53, 1879 (South Seas).—Pöhl: op. cit., 9, p. 36, 1884 (South Seas).

Pseudocheilinus psittacula Schmeltz: op. cit., 3, p. 11, 1866 (South Seas).—Pöhl: op. cit., 9, p. 36, 1884 (South Seas).

Cheilinus oxycephalus Bleeker.

Cheilinus oxycephalus Schmeltz: Mus. Godeffroy, Cat. 7, p. 53, 1879 (South Seas).—Pöhl: op. cit., 9, p. 36, 1884 (South Seas).

Cheilinus trilobatus Lacépède.

Cheilinus trilobatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 53, 1879 (Samoa and Tahiti).—Pöhl; op. cit., 9, p. 36, 1884 (Samoa).

Cheilinus rivulatus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 13, January-March, 1928 (Santa Cruz Islands).

Cheilinus fasciatus (Bloch).

Cheilinus fasciatus Schmeltz: Mus. Godeffroy, Cat. 3, p. 10, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 53, 1879 (Samoa).

In the Queensland Museum one 185 mm. long from the Solomons, obtained by Mr. A. R. Spencer.

Whitley has noticed (Linn. Soc. New South Wales, Proc., abstract September 25, 1929) that *Sparus bandatus* Perry: Arcana, 1810, is a synonym of the present species.

I am now convinced that *Wetmorella* Fowler and Bean (U. S. Nat. Mus., Bull., no. 100, vol. 7, p. 211, April 17, 1928, orthotype *Wetmorella philippina* Fowler and Bean) is the young of *Cheilinus fasciatus*. An examination of small intermediate specimens, besides a paratype of *Cheilinus nigropinnatus* Seale, display the transition. In the latter there are two rows of scales on the cheek, this representing evidently the stage or age at which they first become biserial.

Cheilinus undulatus Rüppell.

Cheilinus undulatus Pöhl: Mus. Godeffroy, Cat. 9, p. 36, 1884 (Tonga).

Cheilinus diagrammus (Lacépède).

Cheilinus radiatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 53, 1879 (Kandavu).—Pöhl: op. cit., 9, p. 36, 1884 (Kandavu).

In the Queensland Museum one 200 mm. long from the Solomons, obtained by Mr. A. R. Spencer.

Cheilinus unifasciatus Streets.

Cheilinus hexagonatus Pöhl: Mus. Godeffroy, Cat. 9, p. 36, 1884 (Mortlock Island).

Generally burnt-carmine above, becoming pale poppy-red on sides and pink below. Each scale on back and sides with vertical carmine bar or streak. Head dull burnt-carmine generally, with olive streaks or bars from eye to maxillary, much narrower than red intervening lines. Also olivaceous spots or blotches obscurely on cheeks and opercles. Transverse pale-pink band on caudal peduncle close behind soft dorsal and anal. Iris carmine. Dorsals neutral-dusky-gray; each membrane terminally of spinous fin with gray-white blotch, also median gray-white longitudinal line. Soft dorsal neutral-dusky anteriorly and greater posterior 2/3 of fin transparent-whitish. Anal white, rosy, or orange at bases of second to fourth membranes and others with pale-yellowish white bases. Caudal neutral-olive, rays become greenish subterminally, fin transparent subterminally; hind edge narrowly gray, upper and lower edges with gray and six obscure bordering darker blotches. Pectoral pale-salmon color. Ventral with large median blackish blotch, becom-

ing neutral-black toward axil, though outer base rosy and terminal part of fin whitish. Length, 220 mm. Honolulu. R. W. Wehrle.

In Honolulu markets, twenty, March 29, one, March 30, one, March 31.

Cheilinus oxyrhynchus Bleeker.

Cheilinus oxyrhynchus Schmeltz: Mus. Godeffroy, Cat. 1, p. 10, 1864 (South Seas).—Schmeltz: op. cit., 3, p. 10, 1866 (South Seas).

Cheilinus chlorurus (Bloch).

Cheilinus chlorurus Schmeltz: Mus. Godeffroy, Cat. 1, p. 10, 1864 (South Seas).—Schmeltz: op. cit., 7, p. 53, 1879 (South Seas).—Pöhl: op. cit., 9, p. 36, 1884 (South Seas).

Cheilinus chlorusus Schmeltz: op. cit., 2, p. 8, 1865 (Samoa). (Misprint.)

Novaculichthys taeniourus (Lacépède).

Novacula taeniura Pöhl: Mus. Godeffroy, Cat. 9, p. 36, 1884 (Yap).

Novaculichthys taeniourus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 13, January-March, 1928 (Santa Cruz Islands).

Novacula vanicolensis Schmeltz: Mus. Godeffroy, Cat. 3, p. 11, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 54 1879 (Samoa and Tahiti).

Novacula vanicorensis Pöhl: op. cit., 9, p. 36, 1884 (Samoa and Tahiti).

Novacula hoedtii Schmeltz: op. cit., 3, p. 11, 1866 (South Seas).—Schmeltz: op. cit., 7, p. 54, 1879 (South Seas).—Pöhl: op. cit., 9, p. 36, 1884 (South Seas).

Brown to neutral-gray, each scale bordered with dark-brown to dusky. Head olive-brown, paler below. Iris rosy. Two oblique dark-olive bars from eye, one from upper edge, and one from hind edge obliquely up and each with narrow, gray, bordering line. From behind posterior dark-olive upward bar, another long one arches down over opercle to subopercle, also still another obliquely back across cheek till little above angle of preopercle edge; these bands also with gray-white bordering lines. Spinous dorsal grayish generally, on membranes forming reticulating rings or oblique lines, resulting spots or blotches olive to neutral-gray; first two membranes largely black, each with small yellow lower spot; often on soft dorsal spots very numerous submarginally, and fin edge narrowly olivaceous. Anal gray, slate-black terminally, fin spotted or blotched olive or gamboge-olive. Caudal neutral dusky basally, then broad subbasal buff band and outer half neutral-dusky, with three or four waved transverse neutral-gray lines. Pectoral orange to buff, basally broadly blackish. Ventral dusky or neutral-black, each membrane dark-gray. Four, 160 to 200 mm. Honolulu. R. W. Wehrle.

Three in Honolulu markets, March 29, five, March 30, three, March 31.

I may note that *Semachlorella* Fowler and Bean (U. S. Nat. Mus., Bull., no. 100, vol. 7, p. 367, April 17, 1928, orthotype *Julis bifer* Lay and Bennett) is an exact synonym of the earlier *Dimalacocentrus* Gill (Acad. Nat. Sci. Philadelphia, Proc., p. 223, 1863, monotype *Novacula kallosoma* Bleeker = *Julis bifer* Lay and Bennett), a forgotten name which compels its suppression.

Hemipteronotus melanopus (Bleeker).

Gray-white generally. Iris pale-buff. Lips white. Head with ecru-drab cloudings. Above terminal half of pectoral large black blotch extending over 4 rows of scales and 6 rows deep, of which 2 rows above lateral line. Each body scale with slightly darker median blotch of drab-gray. Dorsals whitish, grayish terminally. Anals similar. Caudal ecru-drab, paler basally and terminally. Paired fins whitish. Length 180 mm. Honolulu. R. W. Wehrle.

Thirty in Honolulu markets, March 30, six, March 31, one, April 1.

Iniistius pavo (Valenciennes).

Novacula pavo Pöhl: Mus. Godeffroy, Cat. 9, p. 36, 1884 (Mortlock Island).

Two in Honolulu markets, March 30, two, March 31, one, April 1.

CALLYODONTIDAE

Scarichthys auritus (Valenciennes).

Scarichthys auritus Schmeltz: Mus. Godeffroy, Cat. 7, p. 54, 1879 (Kandavu).

Scarichthys coeruleopunctatus (Rüppell).

Scarichthys coeruleo-punctatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 55, 1879 (Samoa).

Scaridea zonarcha Jenkins.

Generally fawn color tinged with wine-purple and mottled with darker; about seven irregular transverse series of pale spots nearly or quite large as pupil. Iris pale-rosy. Lower surface of head pale or dirty white and with four transverse neutral-gray bands. Vertical fins dull-brown, with neutral-dusky narrow bordering line; dorsals thickly blotched with brown; caudal dark-brown, finely spotted or blotched with darker; anal dull oil-green, terminally clouded darker and with three or four oblique dark inclined bars. Paired fins pale-brown. Under surface of body soiled-whitish. Length 165 mm. Honolulu. R. W. Wehrle.

Four in Honolulu markets, July 19.

Leptoscarus viagiensis (Quoy and Gaimard).

Callyodon genistriatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 55, 1879 (Tahiti).—Pöhl: op. cit., 9, p. 37, 1884 (Tahiti).

Callyodon spinidens Schmeltz: op. cit., 8, p. 7, 1881 (Viti).—Pöhl: op. cit., 9, p. 37, 1884 (Viti).

Half-grown specimen in Honolulu market, March 30.

Callyodon perspicillatus (Steindachner).

One in Honolulu market, March 29, two. March 30.

Callyodon erythrodon (Valenciennes).

Pseudoscarus erythrodon Schmeltz: Mus. Godeffroy, Cat. 7, p. 55, 1879 (Yap).—Pöhl: op. cit., 9, p. 37, 1884 (Yap).

Pseudoscarus sumbavensis Schmeltz: op. cit., 2 p. 9, 1865 (Samoa).

Pseudoscarus humbavensis Schmeltz: op. cit., 3, p. 11, 1866 (Samoa).—Pöhl: op. cit., 9, p. 37, 1884 (Samoa). (Misprint.)

Pseudoscarus sumbavensis Schmeltz: op. cit., 7, p. 55, 1879 (Samoa).

Pseudoscarus gymnognathus Schmeltz: op. cit., 7, p. 55, 1879 (Kandavu).—Pöhl: op. cit., 9, p. 37, 1884 (Kandavu).

Callyodon brunneus (Jenkins).

One in Honolulu markets, March 29, four, March 30.

Callyodon quoyi (Valenciennes).

Pseudoscarus quoyi Schmeltz: Mus. Godeffroy, Cat. 8, p. 7, 1881 (Ponape).—Pöhl: op. cit., 9, p. 37, 1884 (Ponape).

Callyodon bataviensis (Bleeker).

Pseudoscarus bataviensis Schmeltz: Mus. Godeffroy, Cat. 7, p. 55, 1879 (Tahiti).—Pöhl: op. cit., 9, p. 37, 1884 (Tahiti).

Callyodon forsteri (Valenciennes).

Scarus galena E. K. Jordan: U. S. Nat. Mus., Proc., vol. 66, p. 32, 1926 (type loc., Honolulu).—Whitley: Pan-Pacific Inst., Jour., vol. 1, no. 2, p. 7, January-March, 1927 (Fiji).—Jordan: op. cit., vol. 2, no. 4, p. 8, October-December, 1927 (Samoa).

Callyodon microcheilos (Bleeker).

Scarus microcheilos Schmeltz: Mus. Godeffroy, Cat. 2, p. 9, 1865 (Samoa).

Callyodon microrhinos (Bleeker).

Pseudoscarus microrhinus Pöhl: Mus. Godeffroy, Cat. 9, p. 37, 1884 (South Pacific).

Callyodon harid (Forskål).

Pseudoscarus harid Schmeltz: Mus. Godeffroy, Cat. 8, p. 7, 1881 (Ponape).—Pöhl: op. cit., 9, p. 37, 1884 (Ponape).

Callyodon cyanognathus (Bleeker).

Pseudoscarus cyanognathus Schmeltz: Mus. Godeffroy, Cat. 7, p. 55, 1879 (Samoa).—Schmeltz: op. cit., 8, p. 7, 1881 (Samoa).

Callyodon dimidiatus (Bleeker).

Pseudoscarus dimidiatus Pöhl: Mus. Godeffroy, Cat. 9, p. 37, 1884 (Pelew Islands).

Callyodon spinus (Kner).

Pseudoscarus spinus Schmeltz: Mus. Godeffroy, Cat. 7, p. 55, 1879 (Viti Islands).

Callyodon janthochir (Bleeker).

Pseudoscarus janthochir Schmeltz: Mus. Godeffroy, Cat. 8, p. 7, 1881 (Ponape).—Pöhl: op. cit., 9, p. 37, 1884 (Ponape).

Callyodon oviceps (Valenciennes).

Pseudoscarus oviceps Schmeltz: Mus. Godeffroy, Cat. 7, p. 55, 1879 (Palau Islands).—Pöhl: op. cit., 9, p. 37, 1884 (Pelew Islands).

Callyodon balinensis (Bleeker).

Scarus balinensis Jordan: Pan-Pacific Inst., Jour., vol. 2, no. 4, p. 8, October-December, 1927 (Samoa).

Callyodon rubroviolaceus (Bleeker).

Pseudoscarus rubroviolaceus Schmeltz: Mus. Godeffroy, Cat. 2, p. 9, 1865 (Samoa).—Schmeltz: op. cit., 3, p. 11, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 55, 1879 (Samoa).—Schmeltz: op. cit., 8, p. 7, 1881 (Samoa).—Pöhl: op. cit., 9, p. 37, 1884 (Samoa).

In Honolulu markets, one, March 29, six, March 30.

Callyodon dubius (Bennett).

Pseudoscarus aeruginosus Schmeltz: Mus. Godeffroy, Cat. 7, p. 55, 1879 (Samoa and Tonga islands).—Pöhl: op. cit., 9, p. 37, 1884 (Samoa).

One obtained in Honolulu market, June 21, 1923, 155 mm. long.

Callyodon globiceps (Valenciennes).

Pseudoscarus globiceps Schmeltz: Mus. Godeffroy, Cat. 7, p. 55, 1879 (Tahiti).—Pöhl: op. cit., 9, p. 37, 1884 (Tahiti).

Pseudoscarus spilonothus Schmeltz: op. cit., 7, p. 55, 1879 (Viti Islands).

Callyodon nuchipunctatus (Valenciennes).

Pseudoscarus nuchipunctatus Schmeltz: Mus. Godeffroy, Cat. 3, p. 11, 1866 (McKean Island, Phoenix Group).

Callyodon ghobban (Forskål).

Pseudoscarus ghobban Schmeltz: Mus. Godeffroy, Cat. 7, p. 55, 1879 (Tahiti).

Callyodon guttatus (Schneider).

Scarus maculosus Schmeltz: Mus. Godeffroy, Cat. 2, p. 9, 1865 (Samoa).

Pseudoscarus singaporensis Schmeltz: op. cit., 8, p. 7, 1881 (Ponape).—Pöhl: op. cit., 9, p. 37, 1884 (Ponape).

Callyodon muricatus (Valenciennes).

Scarus striatus Schmeltz: Mus. Godeffroy, Cat. 1, p. 10, 1864 (South Seas).

ELEOTRIDAE

Bostrichthys sinensis (Lacépède).

Eleotris sinensis Schmeltz: Mus. Godeffroy, Cat. 7, p. 47, 1879 (Kanathia).—Pöhl: op. cit., 9, p. 33, 1884 (Kanathia).—Herre: Bureau of Sci. Philippines, Monograph 23, p. 43, Sep. 15, 1927 (Samoa).

Guavina gyrinoides (Bleeker).

Eleotris gyrinoides Schmeltz: Mus. Godeffroy, Cat. 8, p. 6, 1881 (Ponape).—Pöhl: op. cit., 9, p. 33, 1884 (Ponape).

Oxyeleotris marmorata (Bleeker).

Eleotris marmorata Schmeltz: Mus. Godeffroy, Cat. 2, p. 8, 1865 (Neva River, Viti Levu).—Schmeltz: op. cit., 7, p. 47, 1879 (Viti Levu).—Pöhl: op. cit., 9, p. 33, 1884 (Viti).

Ophiocara ophicephalus (Valenciennes).

Eleotris ophiocephalus Schmeltz: Mus. Godeffroy, Cat. 7, p. 47, 1879 (Viti Islands).—Pöhl: op. cit., 9, p. 33, 1884 (Kanathia).

Ophiocara macrolepidotus (Bloch).

Eleotris macrolepidota Schmeltz: Mus. Godeffroy, Cat. 7, p. 47, 1879 (Pelew Islands).—Pöhl: op. cit., 9, p. 33, 1884 (Pelew Islands).

Eleotris cantoris Schmeltz: op. cit., 7, p. 47, 1879 (Viti Islands).—Pöhl: op. cit., 9, p. 33, 1884 (Kanathia).

Eleotris porocephaloides Schmeltz: op. cit., 7, p. 47, 1879 (Viti Islands).

Ophiocara porocephala Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 13, January-March, 1928 (Santa Cruz Islands).

Ophiocara aporos (Bleeker).

Eleotris aporos Schmeltz: Mus. Godeffroy, Cat. 7, p. 48, 1879 (Viti Islands).—Pöhl: op. cit., 9, p. 33, 1884 (New Britain).

Ophiocara hoedtii (Bleeker).

Eleotris hoedtii Schmeltz: Mus. Godeffroy, Cat. 1, p. 9, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 8, 1865 (Neva River, Viti Levu).—Schmeltz: op. cit., 3, p. 9, 1866 (Viti Levu).—Schmeltz: op. cit., 7, p. 47, 1879 (Viti Levu).—Pöhl: op. cit., 9, p. 33, 1884 (Viti).

Eleotris fusca (Schneider).

Eleotris fusca Schmeltz: Mus. Godeffroy, Cat. 1, p. 9, 1864 (Viti Levu).—Schmeltz: op. cit., 2, p. 8, 1865 (Viti

Levu).—Schmeltz: op. cit., 7, p. 47, 1879 (Viti Levu).—Pöhl: op. cit., 9, p. 33, 1884 (Viti).—Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, January-March, 1928 (Santa Cruz Islands).

Common in Honolulu markets, July 19.

Eleotris melanosoma Bleeker.

Eleotris melanosoma Schmeltz: Mus. Godeffroy, Cat. 3, p. 9, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 47, 1879 (Samoa).—Pöhl: op. cit., 9, p. 33, 1884 (Samoa).

Asterropterix semipunctatus Rüppell.

Eleotris (Asterropteryx) semipunctatus Schmeltz: Mus. Godeffroy, Cat. 8, p. 6, 1881 (Ponape).—Pöhl: op. cit., 9, p. 33, 1884 (Ponape).

Asterropterix semipunctatus Whitley: Pan-Pacific Inst., Jour., vol. 1, no. 2, p. 7, January-March, 1927 (Fiji).

Hypseleotris cyprinoides (Valenciennes).

Eleotris cyprinus Schmeltz: Mus. Godeffroy, Cat. 7, p. 47, 1879 (Viti and Samoa Islands).—Pöhl: op. cit., 9, p. 33, 1884 (Viti).

Eleotris oxycephala (non Schlegel) Schmeltz: op. cit., 3, p. 9, 1866 (Samoa).

Eleotris guentheri Schmeltz: op. cit., 7, p. 47, 1879 (Tonga).

Hypseleotris vanicolensis Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 13, January-March, 1928 (Santa Cruz Islands).

Valenciennea strigatus (Broussonet).

Eleotris strigata Schmeltz: Mus. Godeffroy, Cat. 7, p. 47, 1879 (Samoa and Viti Islands).—Pöhl: op. cit., 9, p. 33, 1884 (Samoa).

Mr. Whitley calls attention to *Valenciennia* Bourguignat, Rev. Mag. Zool., ser. 2, vol. 7, p. 29, 1855, a genus of insects, as precluding *Valenciennea* in fishes. Owing to one letter difference I retain *Valenciennea*.

Valenciennea muralis (Valenciennes).

Eleotris muralis Schmeltz: Mus. Godeffroy, Cat. 7, p. 47, 1879 (Viti and Cooks Islands).

Valenciennea muralis Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 13, January-March, 1928 (Santa Cruz Islands).

Valenciennea longipinnis (Lay and Bennett).

Valenciennea longipinnis Jordan: Pan-Pacific Inst., Jour., vol. 2, no. 4, p. 10, October-December, 1927 (Samoa).

GOBIIDAE

Gobiodon verticalis Alleyne and Macleay.

In Bishop Museum, 3 specimens 24 to 34 mm. long, obtained at Guam in 1926 by Lieut. H. Hornbostel.

Gobiodon rivulatus (Rüppell).

Gobiodon rivulatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 47, 1879 (Kingsmills).—Pöhl: op. cit., 9, p. 33, 1884 (Savaii).

Gobiodon histrio Schmeltz: op. cit., 3, p. 9, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 47, 1879 (Samoa).

Gobiodon ceramensis Schmeltz: op. cit., 3, p. 9, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 47, 1879 (Samoa).—Pöhl: op. cit., 9, p. 33, 1884 (Samoa).

Gobiodon quinque-strigatus Schmeltz: op. cit., 7, p. 47, 1879 (Vavau).

In writing of *Parachacturichthys hinsbyi*, Whitley made *Gobius hinsbyi* the type of his genus *Nesogobius* (Proc. Roy. Soc. Tasmania, p. 62, 1928). The species seems to be restricted to Victoria and Tasmania, so Schmeltz's record of *Gobius pictus* from the Palau Islands is probably wrong. Perhaps he confused it with *Gobius pictus* Malm, instead of *Gobius pictus* Castelnau.

Gobiodon citrinus (Rüppell).

Gobiodon citrinus Schmeltz: Mus. Godeffroy, Cat. 3, p. 47, 1879 (Samoa).—Pöhl: op. cit., 10, p. 33, 1884 (Samoa).

Paragobiodon echinocephalus (Rüppell).

Gobius echinocephalus Schmeltz: Mus. Godeffroy, Cat. 7, p. 46, 1879 (Viti Levu).

Kurtus echinocephalus Pöhl: op. cit., 10, p. 30, 1884 (South Seas).

Gobius amiciensis Schmeltz: op. cit., 7, p. 46, 1879 (Samoa).

Kurtus amiciensis Pöhl: op. cit., 10, p. 30, 1884 (South Seas).

Sicyopterus taeniurus (Günther).

Sicydium taeniurum Schmeltz: Mus. Godeffroy, Cat. 8, p. 6, 1881 (Viti).—Pöhl: op. cit., 9, p. 33, 1884 (Viti).

Sicydium lagocephalum (non Pallas) Schmeltz: op. cit., 7, p. 47, 1879 (Viti Levu).—Pöhl: op. cit., 9, p. 33, 1884 (Viti).

Microsicydium elegans (Steindachner).

In Bishop Museum, one from Papeete market, Tahiti, 30 mm. long, obtained by G. P. Wilder, October 25, 1926. Caught in river mouths in enormous quantities.

Gobius sadanundio Buchanan-Hamilton.

Gobius sadanundio Schmeltz: Mus. Godeffroy, Cat. 7, p. 46, 1879 (Viti Islands).—Pöhl: op. cit., 10, p. 33, 1884 (Kanathia).

Gobius caninus Valenciennes.

Gobius caninus Schmeltz: Mus. Godeffroy, Cat. 7, p. 404, 1879 (Viti Levu).

Gobius elegans Valenciennes.

Gobius elegans Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 13, January-March, 1928 (Santa Cruz Islands).

Gobius petrophilus Bleeker.

Bathygobius petrophilus Whitley: Pan-Pacific Inst., Jour., vol. 1, no. 2, p. 7, January-March, 1927 (Fiji).

Gobius frenatus Günther.*

Gobius frenatus Günther: Cat. Fishes Brit. Mus., vol. 3, p. 39, 1861 (type loc., Australia).—Schmeltz: Mus. Godeffroy, Cat. 1, p. 9, 1864 (South Seas).—Pöhl: op. cit., 10, p. 33, 1884 (South Seas).

The following two references I have been unable to identify:

1. *Gobius cruentatus* (non Gmelin) Pöhl: Mus. Godeffroy, Cat. 10, p. 33, 1884 (Vavau).
2. *Gobius jozo* (non Linné) Pöhl: op. cit., 10, p. 33, 1884 (Ponape).

Bathygobius fuscus (Rüppell).

Gobius soporator (non Valenciennes) Schmeltz: Mus. Godeffroy, Cat. 7, p. 46, 1879 (Samoa and Tonga).—Pöhl: op. cit., 10, p. 33, 1884 (Samoa).

Gnatholepis puntang (Bleeker).

Gobius punctangoides Pöhl: Mus. Godeffroy, Cat. 9, p. 32, 1884 (New Britain).

Chonophorus guamensis (Valenciennes).

Gobius crassilabris Schmeltz: Mus. Godeffroy, Cat. 7, p. 46, 1879 (Viti Islands).—Pöhl: op. cit., 10, p. 33, 1884 (Kanathia).

Chonophorus ocellaris (Broussonet).

Gobius ocellaris Schmeltz: Mus. Godeffroy, Cat. 2, p. 8, 1865 (Neva River, Viti Levu).—Schmeltz: op. cit., 3, p. 9, 1866 (Viti Levu).—Schmeltz: op. cit., 7, p. 46, 1879 (Viti Islands).—Pöhl: op. cit., 10, p. 33, 1884 (Viti).

Chonophorus genivittatus (Valenciennes).

Gobius genivittatus Schmeltz: Mus. Godeffroy, Cat. 2, p. 8, 1865 (Neva River, Viti Levu).—Schmeltz: op. cit., 3, p. 9, 1866 (Viti Levu).—Schmeltz: op. cit., 7, p. 46, 1879 (Viti Levu).—Pöhl: op. cit., 10, p. 32, 1884 (South Seas).

Abundant in Honolulu markets, March 31.

Rhinogobius laddi new species (fig. 6).

Depth 4 1/2; head 3, width 1 1/5. Snout 4 in head; eye 3 2/3, greater than snout, much greater than interorbital; maxillary reaches opposite middle of eye, length 2 1/8 in head; closed jaws even; teeth small, simple, conic, outer row in each jaw slightly and uniformly enlarged, followed by inner band of 2 or 3 irregular rows of close-set smaller teeth; tongue with broad front, and margin with slight median notch; interorbital very narrow, about 10 in head, bony width only half entire width. Gill rakers 3 + 6, short points, about 2/5 of gill filaments, which 2 1/2 in eye.

Scales 33 in median lateral series from suprascapula to caudal base medially, and 2 more on latter; 11 transversely between soft dorsal and anal origins; 12 predorsal scales extend forward 2/3 to eyes or opposite hind edge of preopercle ridge; breast before ventrals naked. A few, feeble, indistinct rows of pores on head as around lower eye edge, on cheek and opercle. Scales with 14 rows of basal radiating striae; 24 or 25 rather long apical denticles; circuli moderate.

D. VI—I, 9, I, second spine longest or 1 4/5 in head, first branched ray 2; A. I, 9, I, first branched ray 2 3/4; caudal 1 1/2, convex behind; least depth of caudal peduncle 2 7/8; pectoral rays 19, length 1 1/4 in head; ventral 1 1/4.

Largely uniform brown, little paler below and pale-gray to whitish on under surface of head. Iris slate-gray. Several indistinct darker blotches or streaks from eye and on lips. Fins with rays of soft dorsal, caudal, and pectoral marked with darker spots, and ventral with dusky on membranes terminally. Length 34 mm.

Type. No. 3483, Bishop Museum. Suva, Fiji, under old coral heads near shore. June, 1926. Closely related to *Rhinogobius multifasciatus* Herre, described from the Jaro River mouth, Iloilo, Philippines. My species differs slightly in the well-developed predorsal scales, and though these are smaller than elsewhere on the body, extend more than half way to the eyes. Other items are the absence of scales before the ventrals on the breast and the absence of dark transverse bands on the body.

Named for Dr. H. L. Ladd, who collected the type, as well as other fishes in Fiji for Bishop Museum.

Rhinogobius neophytus (Günther).

Gobius neophytus Pöhl: Mus. Godeffroy, Cat. 9, p. 33, 1884 (Raiatea).

Drombus whitleyi new name.

Gobius filamentosus (non Risso 1826, Castelnau 1875) Sauvage: Soc. Philom. Paris, Bull. 7th ser., vol. 7, p. 157, 1882 (type loc., New Caledonia).

Mr. Whitley calls my attention to the specific name, which I called *Drombus filamentosus* in my "Fishes of Oceania," as twice preoccupied. I therefore offer the above substitute.

Aboma graeffii (Günther).

Mr. Whitley claims *Gobius petrophilus* var. *ocellata* Kner, used as the original reference for this species in my "Fishes of Oceania," is preoccupied by *Gobius ocellatus* Day, therefore *Aboma ocellata* (Kner) must give way to the above caption.

Amblygobius phalaena (Valenciennes).

Gobius phalaena Schmeltz: Mus. Godeffroy, Cat. 1, p. 9, 1864 (South Seas).—Schmeltz: op. cit., 7, p. 46, 1879 (Viti, Society and Cook Islands).—Pöhl: op. cit., 10, p. 33, 1884 (South Seas).

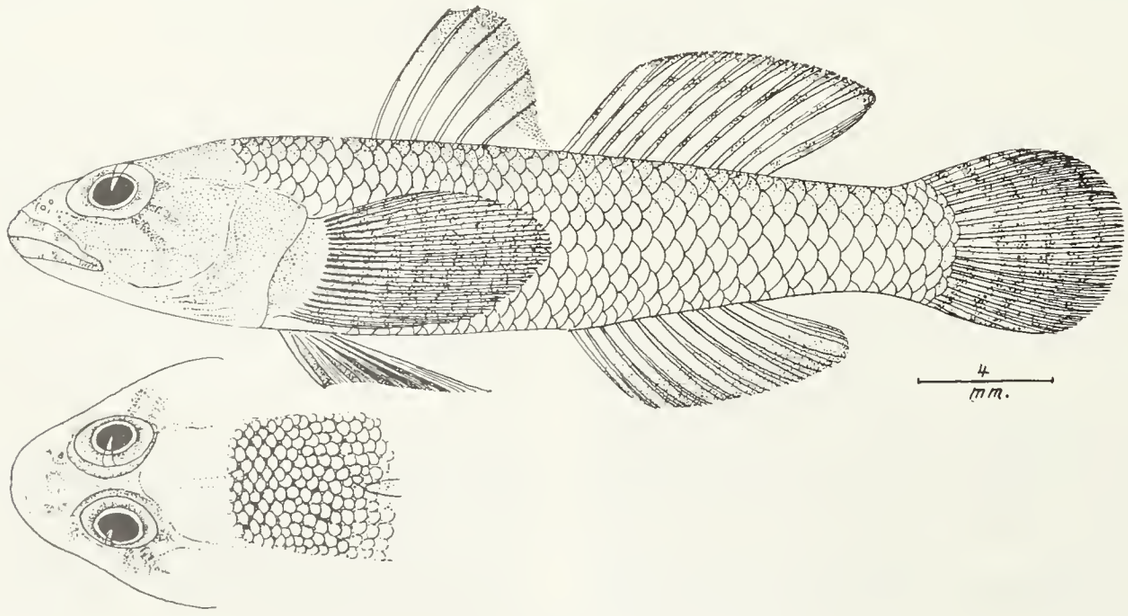


FIGURE 6.—*Rhinogobius laddi* new species. Type.

Amblygobius phalaena Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 13, January-March, 1928 (Santa Cruz Islands).

Bishop Museum has 2 specimens 98 to 102 mm. long, from Guam, obtained by Lieut. H. Hornbostel in 1926.

Amblygobius semicinctus (Bennett).

Gobius semicinctus Schmeltz: Mus. Godeffroy, Cat. 7, p. 46, 1879 (Viti Islands).—Pöhl: op. cit., 10, p. 33, 1884 (Viti).

Zonogobius semidoliatus (Valenciennes).

Gobius semidoliatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 46, 1879 (Samoa and Tonga).

Zonogobius semidoliatus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 13, January-March, 1928 (Santa Cruz Islands).

Three in Bishop Museum, 21 to 34 mm. long, obtained at Suva, Fiji, June 8, 1926, by Dr. H. L. Ladd.

Gobiichthys papuensis (Valenciennes).

Gobius ophthalmotaenia (non Bleeker) Schmeltz: Mus. Godeffroy, Cat. 8, p. 6, 1881 (Ponape).—Schmeltz: op. cit., 9, p. 33, 1884 (Ponape).

In Bishop Museum one, 73 mm. long, from fresh water, Palolo stream, Oahu, January 11, 1927, D. Degeuer.

Periophthalmus koelreuteri (Pallas).

Periophthalmus kölreuteri Schmeltz: Mus. Godeffroy, Cat. 1, p. 9, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 8, 1865 (South Seas).

Periophthalmus koelreuteri Schmeltz: op. cit., 3, p. 9, 1866 (South Seas).—Schmeltz: op. cit., 7, p. 47, 1879 (South Seas).

Periophthalmus koelreuterii Pöhl: op. cit., 9, p. 33, 1884 (South Seas).

Periophthalmus argentilineatus Schmeltz: op. cit., 3, p. 9, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 47, 1879 (Samoa).—Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 13, January-March, 1928 (Santa Cruz Islands).

Boleophthalmus viridis (Buchanan-Hamilton).

In the Queensland Museum, no. 103, types of *Gobiosoma punctularum* De Vis. South Sea Islands. Three examples.

ECHENEIDAE

Echeneis remora Linné.

Echeneis remora Schmeltz: Mus. Godeffroy, Cat. 2, p. 8, 1865 (Samoa).—Schmeltz: op. cit., 3, p. 8, 1866 (Samoa).

Generally dark drab-gray. Ribs of disk all pale or gray-white. Iris neutral-gray. Vertical fins like body. Pectoral drab, paler terminally. Ventral dark drab-gray. Length 127 mm. Honolulu. R. W. Wehrle.

Phtheirichthys lineatus (Menzies).

Echeneis lineata Schmeltz: Mus. Godeffroy, Cat. 1, p. 9, 1864 (South Seas).

PARAPERCIDAE

Parapercis cylindrica (Bloch).

Percis cylindrica Schmeltz: Mus. Godeffroy, Cat. 7, p. 44, 1879 (Kanathia).—Pöhl: op. cit., 9, p. 32, 1884 (Kanathia).

Parapercis hexophthalma (Cuvier).

Percis hexophthalma Schmeltz: Mus. Godeffroy, Cat. 7, p. 44, 1879 (Kandavu).

Parapercis tetracanthus (Bleeker).

Percis tetracanthus Schmeltz: Mus. Godeffroy, Cat. 3, p. 8, 1866 (Viti Levu).—Schmeltz: op. cit., 7, p. 44, 1879 (Viti Islands).—Pöhl: op. cit., 10, p. 32, 1884 (Viti).

BLENNIIDAE

Enneapterygius hemimelas (Kner and Steindachner).

Tripterygium hemimelas Schmeltz: Mus. Godeffroy, Cat. 3, p. 10, 1866 (Samoa).

Petroscirtes filamentosus (Valenciennes).

Petroscirtes filamentosus Schmeltz: Mus. Godeffroy, Cat. 7, p. 48, 1879 (Society and Tuamotu Islands).—Pöhl: op. cit., 9, p. 34, 1884 (Vavao).—Jordan: Pan-Pacific Inst., Jour., vol. 2, no. 4, p. 11, October-December, 1927 (Samoa).

Petroscirtes atrodorsalis Günther.

Petroscirtes atrodorsalis Schmeltz: Mus. Godeffroy, Cat. 7, p. 48, 1879 (Viti Islands).

Petroscirtes elongatus Peters.

Petroscirtes kallosoma Schmeltz: Mus. Godeffroy, Cat. 7, p. 48, 1879 (Viti Islands).

Petroscirtes mitratus Rüppell.

Petroscirtes mitratus Schmeltz: Mus. Godeffroy, Cat. 8, p. 6, 1881 (Ponape).

Petroscirtes longifilis Schmeltz: op. cit., 3, p. 9, 1866 (Samoa).

Petroscirtes tapeinosoma Bleeker.

Petroscirtes tapeinosoma Pöhl: Mus. Godeffroy, Cat. 9, p. 34, 1884 (Ponape).

Petroscirtes anema Bleeker.*

Petroscirtes anema Bleeker: Naturk. Tijds. Nederland. Indie, vol. 3, p. 273, 1852 (type loc., Amboina).—Pöhl: Mus. Godeffroy, Cat. 9, p. 33, 1884 (Yap).

Cirripectes brevis (Kner).

Salarias brevis Pöhl: Mus. Godeffroy, Cat. 9, p. 34, 1884 (Ponape).

Cirripectes variolosus (Valenciennes).

Salarias variolosus Schmeltz: Mus. Godeffroy, Cat. 7, p. 48, 1879 (Samoa and Tonga Islands).—Pöhl: op. cit, 9, p. 34, 1884 (Tonga).

Salarias nitidus Günther.

Salarias nitidus Schmeltz: Mus. Godeffroy, Cat. 7, p. 48, 1879 (Pelew Islands).

Salarias fasciatus (Bloch).

Salarias fasciatus Schmeltz: Mus. Godeffroy, Cat. 1, p. 9, 1864 (South Seas).—Schmeltz: op. cit., 2, p. 8, 1865 (South Seas).—Schmeltz: op. cit., 3, p. 9, 1866 (South Seas).—Schmeltz: op. cit., 7, p. 48, 1879 (South Seas).—Pöhl: op. cit., 9, p. 34, 1884 (South Seas).—Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 13, January-March, 1928 (Santa Cruz Islands).

Salarias fuscus Rüppell.

Salarias fuscus Schmeltz: Mus. Godeffroy, Cat. 7, p. 49, 1879 (Boston Island).

Salarias holomelas Schmeltz: op. cit., 7, p. 49, 1879 (Pelew Islands).—Pöhl: op. cit., 9, p. 34, 1884 (Pelew Islands).

Salarias marmoratus (Bennett).

Salarias marmoratus Schmeltz: Mus. Godeffroy, Cat. 3, p. 9, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 48, 1879 (Samoa).

Salarias arenatus Schmeltz: op. cit., 7, p. 48, 1879 (Tahiti).

Salarias guttatus Valenciennes.

Salarias guttatus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 13, January-March, 1928 (Santa Cruz Islands).

In the Queensland Museum, no. 76, type of *Salarias griseus* De Vis. South Sea Islands.

Salarias gibbifrons Quoy and Gaimard.

Two in Bishop Museum, 60 to 78 mm. long, obtained at Suva Point, Fiji, June 16, 1926, by Dr. H. L. Ladd.

Salarias edentulus (Schneider).

Salarias edentulus Schmeltz: Mus. Godeffroy, Cat. 7, p. 48, 1879 (New Caledonia).

Salarias quadricornis Schmeltz: op. cit., 2, p. 8, 1865 (MacKean Island, Phoenix Group).—Schmeltz: op. cit., 3, p. 9, 1866 (MacKean Island).—Schmeltz: op. cit., 7, p. 49, 1879 (Samoa and Phoenix Islands).—Pöhl: op. cit., 9, p. 34, 1884 (Samoa).

Salarias rivulatus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 13, January-March, 1928 (Santa Cruz Islands).

Salarias periophthalmus Valenciennes.

Salarias periophthalmus Schmeltz: Mus. Godeffroy, Cat. 7, p. 48, 1879 (Savaii and Samoa Islands).—Pöhl: op. cit., 9, p. 34, 1884 (Savaii).—Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 13, January-March, 1928 (Santa Cruz Islands).

Salarias meleagris Valenciennes.

Salarias meleagris Schmeltz: Mus. Godeffroy, Cat. 7, p. 49, 1879 (Viti Islands).—Pöhl: op. cit., 9, p. 34, 1884 (Viti).

Salarias lineatus Valenciennes.

Salarias lineatus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 13, January-March, 1928 (Santa Cruz Islands).

Salarias oortii Bleeker.

Salarias oortii Schmeltz: Mus. Godeffroy, Cat. 7, p. 49, 1879 (Kandavu).

Salarias hasseltii Bleeker.*

Salarias hasseltii Bleeker: Nat. Tijds. Nederl. Indie, vol. 1, p. 257, 1850 (type loc., Tjilankahan, Java).—Schmeltz: Mus. Godeffroy, Cat. 7, p. 49, 1879 (South Seas).—Pöhl: op cit., 9, p. 34, 1884 (South Seas).

Salarias hasselti Whitley: Pan-Pacific Inst., Jour., vol. 1, no. 2, p. 7, January-March, 1927 (Fiji).

Salarias striatomaculatus Kner and Steindachner.*

Salarias striatomaculatus Kner and Steindachner: Akad. Wiss. Wien, Sitz., vol. 54, p. 368, fig. 4, 1866 (type loc., Mauritius).—Jordan: Pan-Pacific Inst., Jour., vol. 2, no. 4, p. 11, October-December, 1927 (Samoa).

Enchelyurus ater (Günther).

Petroscirtes ater Schmeltz: Mus. Godeffroy, Cat. 7, p. 48, 1879 (Tonga Islands).

BROTULIDAE

Brotula ensiformis Günther.

Brotula ensiformis Pöhl: Mus. Godeffroy, Cat. 9, p. 38, 1884 (Pelew Islands).

CARAPIDAE

Carapus homei (Richardson).

Fierasfer homei Schmeltz: Mus. Godeffroy, Cat. 3, p. 11, 1866 (Samoa "Schuuorotz in? *Stichopus tuberculosus* Q. & G.").—Schmeltz: op. cit., 7, p. 56, 1879 (Society Islands).—Pöhl: op. cit., 9, p. 38, 1884 (Samoa).

Carapus homei Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 13, January-March, 1928 (Santa Cruz Islands).

Jordanicus parvipinnis (Kaup).

Fierasfer parvipinnis Schmeltz: Mus. Godeffroy, Cat. 7, p. 56, 1879 (Samoa).

Fierasfer parvipennis Schmeltz: op. cit., 9, p. 38, 1884 (Samoa).

Carapus parvipinnis Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 13, January-March, 1928 (Santa Cruz Islands).

Jordanicus garcilis (Bleeker).

In Bishop Museum two specimens, 80 to 150 mm. long, from Kaneohe Bay, March, 1928, T. T. Dranga.

GOBIESOCIDAE

Aspasmogaster oro (Steindachner).*

Aspasmogaster oro Jordan: Pan-Pacific Inst., Jour., vol. 2, no. 4, p. 10, October-December, 1927 (Samoa).

The original reference to this species I have not located.

BALISTIDAE

Canthidermis maculatus (Bloch).

Balistes maculatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 61, 1879 (Pelew Islands).—Pöhl: op. cit., 9, p. 41, 1884 (Pelew Islands).

Balistes vidua Richardson.

Balistes vidua Schmeltz: Mus. Godeffroy, Cat. 7, p. 61, 1879 (Samoa and Tahiti).—Pöhl: op. cit., 9, p. 40, 1884 (Samoa).

Generally seal-brown, with sepia and olive tinge on sides. Lips cinnamon. Teeth white. Iris olive-yellow. First dorsal with membranes olive-yellow, dusky to slate-black on margins and on spines. Second dorsal white, cream color basally, narrow scaly basal border, also border of fin all around except hind edge of last ray black. Anal like dorsal. Caudal white basally, rays flesh color, likewise membranes terminally and upper and lower edges of fin very narrowly blackish. Pectoral gamboge-yellow, edge narrowly dusky. Length 165 mm. Honolulu. R. W. Wehrle.

One, 250 mm., in the Bishop Museum from off Napoopoo, Hawaii, October 22, 1926.

Balistes chrysopterus Schneider.

Balistes niger (non Bloch 1786) Schmeltz: Mus. Godeffroy, Cat. 7, p. 61, 1879 (Samoa).—Pöhl: op. cit., 9, p. 40, 1884 (Samoa).

Balistes bursa Schneider.

Balistes bursa Schmeltz: Mus. Godeffroy, Cat. 1, p. 10, 1864 (South Seas).—Schmeltz: op. cit., 7, p. 61, 1879 (South Seas).

Head above bister, body generally olive. Clove-brown crescent begins little above and behind eye, arches down till close before pectoral base. Another clove-brown bar, slightly curved from above gill opening down over front bones of shoulder girdle and includes pectoral base; this gives off five or six obscure, dark, longitudinal, inclined bars forking so each includes longitudinal intersections as streak between ridges of keeled spines. Pearl-white line crosses chin, encircles both upper and lower lips, then diverges back along lower side of head slightly waved to anal origin, then forward short space to encircle all of blackish, pelvic flap. Lower surface of head

and trunk below pearly line drab-gray to ecru-drab, still paler below. Iris dull-brown, golden circle around pupil. Spinous dorsal dusky-brown, spines darker, membranes terminally with white, largest extent on second. Soft dorsal and anal cream-buff, slightly grayish terminally; bases of both fins rather sharply and narrowly dark-sepia. Caudal neutral-brown, darker basally. Pectoral dull-cream, with pale-olive tinge basally. Two, 176 to 198 mm. Honolulu. R. W. Wehrle.

Balistes viridescens Schneider.

Balistes viridescens Schmeltz: Mus. Godeffroy, Cat. 3, p. 12, 1866 (Samoa).

Balistes ringens Linné.

Balistes armatus Schmeltz: Mus. Godeffroy, Cat. 3, p. 12, 1866 (Samoa).

Balistes aureolus Schmeltz: op. cit., 7, p. 61, 1879 (Pacific Ocean).—Pöhl: op. cit., 9, p. 40, 1884 (South Seas).

Balistes flavimarginatus Rüppell.

Balistes flavimarginatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 61, 1879 (Upolu and Tahiti).—Pöhl: op cit., 9, p. 40, 1884 (Upolu).

Balistapus aculeatus (Linné). (Fig. 7.)

Aluteres aculeatus Schmeltz: Mus. Godeffroy, Cat. 1, p. 11, 1864 (South Seas).

Balistes aculeatus Schmeltz: op. cit., 3, p. 12, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 61, 1879 (South Seas).

Balistapus rectangulus (Schneider).

Balistes rectangulus Schmeltz: Mus. Godeffroy, Cat. 7, p. 62, 1879 (South Seas).—Pöhl: op. cit., 9, p. 40, 1884 (Samoa).

Balistes erythropterus Schmeltz: op. cit., 3, p. 12, 1866 (South Seas).

Balistapus verrucosus (Linné).

Balistes verrucosus Schmeltz: Mus. Godeffroy, Cat. 7, p. 61, 1879 (Pelew [Palau] Islands).—Pöhl: op. cit., 9, p. 40, 1884 (South Seas).

Balistapus undulatus (Mungo Park).

Balistes undulatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 62, 1879 (South Sea and Savaii).—Pöhl: op. cit., 9, p. 40, 1884 (Savaii).

Balistes lineatus Schmeltz: op. cit., 2, p. 10, 1865 (Samoa).—Schmeltz: op. cit., 3, p. 12, 1866 (Samoa).

Balistapus lineatus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 13, January-March, 1928 (Santa Cruz Islands).

One in Honolulu market, March 29.

Melichthys buniva (Lacépède).

Balistes (Melanichthys) buniva Schmeltz: Mus. Godeffroy, Cat. 7, p. 62, 1879 (Raiatea).

Balistes buniva Pöhl: op. cit., 9, p. 40, 1884 (Raiatea).

Slate-black generally. Teeth pale, each with ill-defined dark median blotch. Iris slate. Spinous dorsal black.

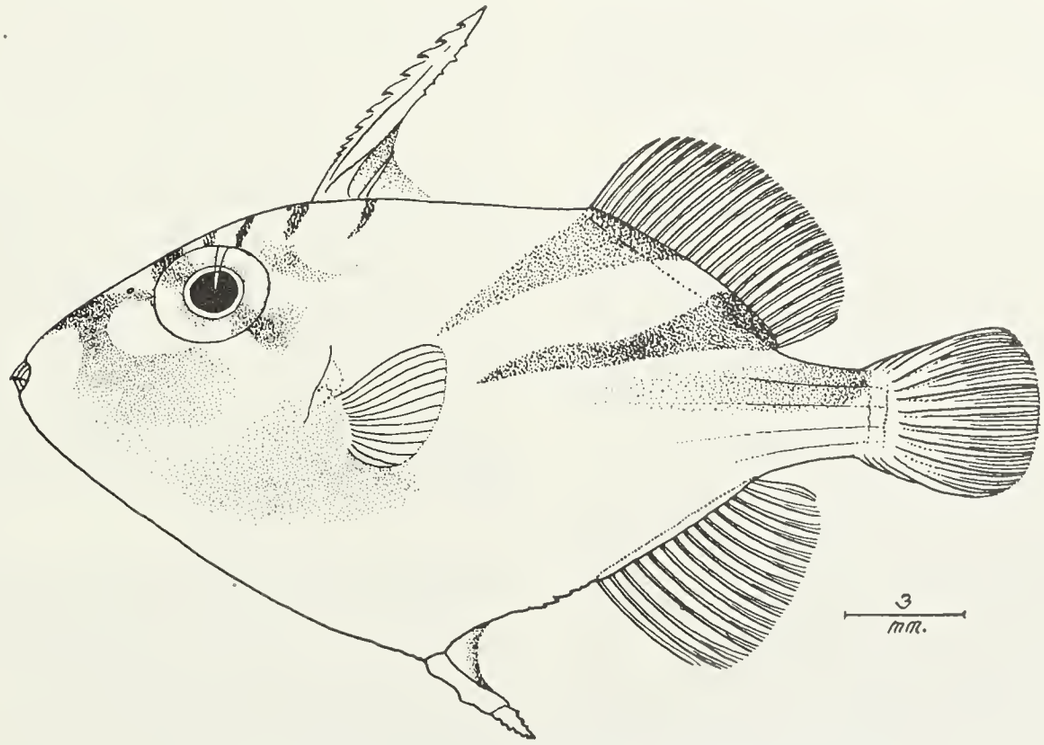


FIGURE 7.—*Balistapus aculeatus* (Linné). Young, from Raiatea.

Balistapus aculeatus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 13, January-March, 1928 (Santa Cruz Islands).

In Honolulu markets, one, March 29, six, March 31.

In Bishop Museum two, 26 to 29 mm. long, from Vaiaau, Raiatea, in algae on coral near shore. May 18, 1927. J. W. Moore. Native name "Ine."

Along bases of soft dorsal and anal narrow pearl-white line, becomes slightly wider posteriorly on each fin. Length 203 mm. Honolulu. R. W. Wehrle.

One in Honolulu market, March 29.

Odonus erythrodon (Günther).

Balistes (Erythrodon) erythrodon Schmeltz: Mus. Godeffroy, Cat. 7, p. 62, 1879 (Raiatea).

Balistes erythrodon Pöhl: op. cit., 9, p. 40, 1884 (Raiatea).

MONACANTHIDAE

Monacanthus chinensis (Osbeck).

Monacanthus chinensis Schmeltz: Mus. Godeffroy, Cat. 2, p. 10, 1865 (Samoa).

Monacanthus megalurus Schmeltz: Mus. Godeffroy, Cat. 7, p. 62, 1879 (Samoa).

Monacanthus tetragonus (Heckel) Schmeltz, is quoted "Mus. Caes. Vindob." in Mus. Godeffroy, Cat. 2, p. 10, 1865 (type loc., South Seas) (no description).—Schmeltz: op. cit., 3, p. 12, 1866 (South Seas). I have not found its proper location.

Monacanthus tomentosus (Linné).

Monacanthus tomentosus Schmeltz: Mus. Godeffroy, Cat. 7, p. 62, 1879 (Kanathia and Palau Islands).

Monacanthus spilosoma Lay and Bennett.

In Bishop Museum two, 68 to 72 mm., labeled Hawaiian Islands.

Cantherines pardalis (Rüppell).

Monacanthus pardalis Schmeltz: Mus. Godeffroy, Cat. 7, p. 62, 1879 (South Seas).—Pöhl: op. cit., 9, p. 41, 1884 (South Seas).

Monacanthus pardalis var. *rüppellii* Schmeltz: op. cit., 7, p. 62, 1879 (Viti Islands).

Amanses scopas (Cuvier).

Amanses scopas Schmeltz: Mus. Godeffroy, Cat. 3, p. 12, 1866 (Samoa).

Oxymonacanthus longirostris (Schneider).

Monacanthus longirostris Schmeltz: Mus. Godeffroy, Cat. 3, p. 12, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 62, 1879 (Samoa).—Pöhl: op. cit., 9, p. 14, 1884 (South Seas).

Alutera scripta (Osbeck).

Aluteres laevis Schmeltz: Mus. Godeffroy, Cat. 3, p. 12, 1866 (Samoa).

Alutera monoceros (Linné).

Aluteres monoceros Pöhl: Mus. Godeffroy, Cat. 9, p. 41, 1884 (South Seas).

Aluteres anguinosus Pöhl: op. cit., 9, p. 41, 1884 (South Seas).

OSTRACIIDAE

Ostracion cubicus Linné.

Ostracion cubicus Schmeltz: Mus. Godeffroy, Cat. 7, p. 62, 1879 (South Seas).—Pöhl: op. cit., 9, p. 41, 1884 (South Seas).

In the Bishop Museum one, 38 mm. long, from Guam, 1926. Lieut. H. Hornbostel.

Ostracion sebae Bleeker.

Ostracion sebae Schmeltz: Mus. Godeffroy, Cat. 3, p. 12, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 62, 1879 (South Seas).—Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 13, January-March, 1928 (Santa Cruz Island).

One without locality (likely Honolulu?), 92 mm., in the Bishop Museum, 1928. T. T. Dranga.

Ostracion lentiginosum Schneider.

Ostracion meleagris Schmeltz: Mus. Godeffroy, Cat. 2, p. 10, 1865 (Uea, Wallis Island).—Schmeltz: op. cit., 3, p. 12, 1866 (Samoa).

Ostracion punctatus Schmeltz: op. cit., 7, p. 62, 1879 (South Seas).—Pöhl: op. cit., 9, p. 41, 1884 (South Seas).

Ostracion whitleyi new name.

Ostracion ornatus (non Gray) (Guichenot) Hollard: Ann. Sci. Nat. Zool., vol. 7, p. 166, 1857 (type loc., Marquesas Islands).

Mr. Whitley calls my attention to Hollard's name as preoccupied by *Ostracion* (*Aracana*) *ornata* Gray, Ann. Nat. Hist., vol. 1, 1838, p. 110.

Ostracion nasus Bloch.

Ostracion nasus Schmeltz: Mus. Godeffroy, Cat. 7, p. 62, 1879 (Pelew Islands).

Ostracion cornutus Linné.

Ostracion cornutus Schmeltz: Mus. Godeffroy, Cat. 3, p. 12, 1866 (Samoa).—Schmeltz: op. cit., 7, p. 62, 1879 (South Seas).—Pöhl: op. cit., 9, p. 41, 1884 (South Seas).

Two in Honolulu markets, March 29.

Ostracion diaphanus Schneider.

Ostracion paschae Rendahl: Nat. Hist. Juan Fernandez and Easter Island, Skottsberg, vol. 3, Zool. pt. 1, p. 67, 1921 (type loc., Easter Island).

Rendahl's type specimen of *Ostracion paschae* was 152 mm. The description surely shows closer affinity with *Ostracion diaphanus,* as not only are the preocular spines described as short, but on the lower lateral (ventral) "ridge there are also two other smaller spines, the anterior at the same vertical as the central spine, the posterior opposite to the origin of the dorsal fin." On the contrary "the bridge across the back of the tail is formed by three transverse series of scutes" instead of four, showing affinity with *Ostracion fornasini.* This last character, however, is possibly one subject to greater variation than supposed by Günther. In that case *Ostracion paschae* would truly more closely approach *Ostracion diaphanus.* Rendahl's contention for its apparent comparatively larger eye would hardly obtain, as variation in the size of the eye in various species of Ostracion, due either to age or the individual, is sometimes considerable. I have therefore provisionally placed *Ostracion paschae* with *Ostracion diaphanus.*

Ostracion fornasini Bianconi.

Twelve, 17 to 25 mm., in the Bishop Museum. "Storn, of Mahuuapla." February 19, 1924.

CANTHIGASTERIDAE

Canthigaster cinctus (Richardson).

Tetrodon valentini Pöhl: Mus. Godeffroy, Cat. 9, p. 41, 1884 (New Britain).

Canthigaster valentini Jordan: Pan-Pacific Inst., Jour., vol. 2, no. 4, p. 9, October-December, 1927 (Samoa).

Canthigaster bennettii (Bleeker).

Tetrodon bennettii Schmeltz: Mus. Godeffroy, Cat. 7, p. 63, 1879 (Viti Islands).

Canthigaster margaritatus (Rüppell).

Tetrodon margaritatus Pöhl: Mus. Godeffroy, Cat. 9, p. 41, 1884 (Samoa).

Tetrodon solandri Schmeltz: op. cit., 2, p. 10, 1865 (Samoa).—Schmeltz: op. cit., 3, p. 12, 1866 (Samoa).

Tetrodon (*Anosmius*) *margaritatus* Schmeltz: op. cit., 7, p. 63, 1879 (Samoa).

Tetrodon papua var. *striolatus* Schmeltz: op. cit., 7, p. 63, 1879 (Viti Islands).

Canthogaster papua var. *striolatus* Pöhl: op. cit., 9, p. 41, 1884 (Kandavu).

Two in the Bishop Museum, 71 to 88 mm., Guam, 1926. Lieut. H. Hornbostel.

Canthigaster janthinopterus (Bleeker).

Tetrodon janthinopterus Pöhl: Mus. Godeffroy, Cat. 9, p. 41, 1884 (Ponape).

TETRODONTIDAE

Sphoeroides oblongus (Bloch).

Gastrophysus oblongus Schmeltz: Mus. Godeffroy, Cat. 3, p. 12, 1866 (Samoa).

Tetrodon albopunctatus Schmeltz: op. cit., 3, p. 12, 1866 (Samoa).

Sphoeroides hypselogenion (Bleeker).

Tetrodon hypselogenion Schmeltz: Mus. Godeffroy, Cat. 7, p. 62, 1879 (Samoa).—Pöhl: op. cit., 9, p. 41, 1884 (Samoa).

Arothron testudinarius (non Linné) Schmeltz: op. cit., 2, p. 10, 1865 (South Seas).

Two in Honolulu markets, March 29.

Sphoeroides hamiltoni (Richardson).

Tetrodon hamiltonii Schmeltz: Mus. Godeffroy, Cat. 3, p. 12, 1866 [locality given as "M.B.," likely an error for MacKeans Island, Phoenix Group].

Tetrodon insularum De Vis:

In the Queensland Museum, no. 108, types of *Tetrodon insularum* De Vis. Api, New Hebrides. Three examples 100 mm. long.

Tetrodon immaculatus Schneider.

Tetrodon (*Arothron*) *immaculatus* Schmeltz: Mus. Godeffroy, Cat. 7, p. 63, 1879 (South Sea Islands).

Tetrodon virgatus Schmeltz: op. cit., 2, p. 10, 1865 (Samoa).

Tetrodon (*Arothron*) *immaculatus* var. *virgatus* Schmeltz: op. cit., 7, p. 63, 1879 (Kanathia).

Tetrodon scaber Schmeltz: op. cit., 3, p. 12, 1866 (Samoa).

Tetrodon mappa Lesson.

Tetrodon mappa Schmeltz: Mus. Godeffroy, Cat. 7, p. 63, 1879 (Savaii).—Pöhl: op. cit., 9, p. 41, 1884 (Savaii).

Tetrodon stellatus Schneider.

Tetrodon stellatus Schmeltz: Mus. Godeffroy, Cat. 7, p. 63, 1879 (Samoa).

Tetrodon hispidus Linné.

Tetrodon hispidus Schmeltz: Mus. Godeffroy, Cat. 7, p. 63, 1879 (Tonga Islands).—Pöhl: op. cit., 9, p. 41, 1884 (Samoa).

Tetraodon hispidus Whitley: Pan-Pacific Inst., Jour., vol. 3, no. 1, p. 13, January-March, 1928 (Santa Cruz Islands).

Tetrodon hispidus var. *laterna* Schmeltz: op. cit., 7, p. 63, 1879 (Samoa).

Abundant in Honolulu markets, March 29, 30, 31, April 1.

Tetrodon nigropunctatus Schneider.

Crayracion nigropunctatus Schmeltz: Mus. Godeffroy, Cat. 3, p. 12, 1866 (Samoa).

Tetrodon nigropunctatus Schmeltz: op. cit., 7, p. 63, 1879 (Samoa).—Pöhl: op. cit., p. 41, 1884 (Samoa).

Tetrodon meleagris Schneider.

Tetrodon meleagris Schmeltz: Mus. Godeffroy, Cat. 7 p. 63, 1879 (Marquesas Islands).—Schmeltz: op. cit., 8, p. 8, 1881 (Marquesas Islands).

One in the Bishop Museum from Honolulu, obtained in 1928 by C. Dranga.

The reference to *Tetrodon scaber* Eydoux and Souleyet by Pöhl: Mus. Godeffroy, Cat. 9, p. 41, 1884 (South Sea) hardly establishes the species in Oceania.

DIODONTIDAE

Diodon hystrix Linné.

Diodon hystrix Pöhl: Mus. Godeffroy, Cat. 9, p. 41, 1884 (Raiatea).

Diodon holacathus Linné.

Diodon holacanthus Rendahl: Nat. Hist. Juan Fernandez and Easter Island, Skottsberg, vol. 3, Zool. pt. 1, p. 68, 1921 (Easter Island).

Chilomycterus orbicularis Schmeltz: Mus. Godeffroy, Cat. 7, p. 63, 1879 (Samoa).

Diodon coeruleus Pöhl: op. cit., 9, p. 41, 1884 (South Seas).

Diodon maculatus Pöhl: op. cit., 9, p. 41, 1884 (Pelew [Palau] Islands).

Chilomycterus affinis Günther.

One adult in Honolulu market, April 2.

CERATIIDAE

Chaunax pictus Lowe.

Chaunax pictus: Zool. Soc. London, Trans., vol. 3, p. 339, 1846 (type loc., Camera de Lobos, Madeira).—Whitley: Pan-Pacific Inst., Jour., vol. 1, no. 2, p. 8, January-March, 1927 (Fiji).

ANTENNARIIDAE

Histrio histrio (Linné).

Antennarius marmoratus Schmeltz: Mus. Godeffroy, Cat. 7, p. 48, 1879 (South Seas).

Antennarius multiocellatus Schmeltz: op. cit., 7, p. 48, 1879 (Huahine).

Antennarius hispidus (Schneider).

Antennarius hispidus Schmeltz: Mus. Godeffroy, Cat. 7, p. 48, 1879 (Viti).

Antennarius commersonii (Shaw).

Antennarius commersonii Schmeltz: Mus. Godeffroy, Cat. 7, p. 48, 1879 (Society Islands).—Pöhl: op. cit., 10, p. 32, 1884 (Tahiti).

Dull drab-gray to smoke-gray, mottled or blotched with mouse to neutral-gray. Pale or creamy blotch above and before pectoral origin. Iris whitish. Vertical fins all gray-white, each with close-set and very variable neutral or slate-black blotches or spots. Paired fins lighter, and spots more brownish-slate, though small, numerous, and well contrasted. Lips pale. Length 100 mm. (bait damaged). Honolulu. R. W. Wehrle.

Antennarius nummifer Cuvier.

Antennarius nummifer Schmeltz: Mus. Godeffroy, Cat. 7, p. 48, 1879 (Raiatea).

Antennarius bigibbus Lacépède.

Antennarius bigibbus Schmeltz: Mus. Godeffroy, Cat. 7, p. 48, 1879 (Paumotu and Society Islands).

Antennarius nigromaculatus Playfair.*

Antennarius nigromaculatus Playfair: Zool. Soc. London, Proc., p. 239, 1869 (type loc., Zanzibar).—Jordan: Pan-Pacific Inst., Jour., vol. 2, no. 4, p. 11, October-December, 1927 (Samoa).

INDEX

(Page numbers in bold type indicate principal references.)

A — Page

abbreviata, Moringua ... 316
abbreviatus, Aphthalmichthys ... 316
abdominalis, Abudefduf ... 352
Ablennes hians ... 319
Aboma graeffii ... 362
ocellata ... 362
Abudefduf abdominalis ... 352
albofasciatus ... 353
amabilis ... 353
bengalensis ... 352
biocellatus ... 352
curacao ... 352
cyaneus ... 352
dickii ... 352
glaucus ... 352
lacrymatus ... 352
leucopomus ... 353
leucozonus ... 352
saxatilis ... 352
septemfasciatus ... 352
sexfasciatus ... 352
sordidus ... 352
taupou ... 352
unimaculatus ... 352
uniocellatus ... 353
xanthozona ... 353
zonatus ... 353
Abudefdufidae ... 350
Acanthias vulgaris ... 314
Acanthistius fuscus ... 330
Acanthochromis ... 351
Acanthocybium solandri ... 325
Acanthurus achilles ... 345
bipunctatus ... 344
blochii ... 344
ctenodon ... 344
fuliginosus ... 344
gahm ... 345
glaucopareius ... 345
guttatus ... 345
hepatus ... 344
hypselopterus ... 345
lineatus ... 345
matoides ... 344
nigroris ... 345
nigros ... 344
nigrus ... 345
olivaceus ... 345
rhombeus ... 346
scopas ... 346
striatus ... 345
strigosus ... 344
triostegus ... 345
velifer ... 346
achilles, Acanthurus ... 345
Hepatus ... 345
Achirophichthys typus ... 313, 316
Achirus hartzfeldii ... 320
pavoninus ... 321
poropterus ... 320
thepassi ... 320
aculeatus, Balistapus ... 365
Balistes ... 365
Gasterosteus ... 323
acuminatus, Heniochus ... 343
acutus, Carcharias ... 314
adustus, Myripristis ... 323
aeruginosus, Pscudoscarus ... 360
Aetobatus narinari ... 314
affine, Plectorhinchus ... 334
affinis, Chilomycterus ... 367
agama, Zebrasoma ... 346
Agonostoma plikatile ... 325
agrammus, Ambassis ... 313, 329
alalunga, Germo ... 325
alba brunnea, Scorpaena ... 348

Page

albicans, Muraena picta var. ... 317
albobrunneus, Sebastapistes ... 348
albofasciatus, Abudefduf ... 353
Glyphidodon ... 353
albopunctata, Teuthis ... 347
albopunctatus, Siganus ... 347
Tetrodon ... 367
albovittata, Stethojulis ... 354
Albula conorhynchus ... 315
vulpes ... 315
Albulidae ... 315
alburnus, Spratelloides ... 315
Stolephorus ... 315
alletteratus, Euthynnus ... 325
alternans, Ophisurus ... 316
alternanus, Ophisurus ... 316
altivelioides, Serranus ... 331
Alutera monoceros ... 366
scripta ... 366
Aluteres anguinosus ... 366
laevis ... 366
monoceros ... 366
amabilis, Abudefduf ... 353
Glyphisodon ... 353
Amanses scopas ... 366
Ambassidae ... 329
Ambassis agrammus ... 313, 329
batjanensis ... 329
buton ... 313, 329
commersoni ... 329
commersonii ... 329
confinis ... 330
dussumieri ... 329
dussumierii ... 329
gigas ... 329
gymnocephalus ... 329
interrupta ... 329
miops ... 329
occidentalis ... 330
reticulata ... 313, 329
interrupta var. reticulata ... 329
safgha ... 329
urotaenia ... 329
ambassis, Ambassis ... 329
amblycephalus, Julis ... 357
Thalassoma ... 357
Amblygobius phalaena ... 362, 363
semicinctus ... 363
amblyodon, Muraena ... 317
amboinensis, Amia ... 328
Apogon ... 328
Gerres ... 336
Keris ... 346
Amia amboinensis ... 328
aroubiensis ... 327
bandanensis ... 327
beauforti ... 328
ceramensis ... 328
dammermani ... 313, 328
endekataenia ... 313, 328
exostigma ... 313, 328
fleurieu ... 328
frenata ... 328
fusca ... 328
gjellerupi ... 313, 327
hartzfeldii ... 327
heurni ... 313, 327
hyalosoma ... 328
hypselonota ... 328
koilomatodon ... 327
laterale ... 328
leptacantha ... 328
maculosa ... 328
melas ... 313, 328
nematacantha ... 328
nematoptera ... 327

Page

nigripinnis ... 328
novae-guineae ... 328
novemfasciata ... 327
orbicularis ... 327
quadrifasciata ... 313, 328
rhodoptera ... 327
rhodopterus ... 327
sandei ... 327
sangiensis ... 328
taenioptera ... 328
trifasciata ... 327
trimaculata ... 327
tubulata ... 328
versicolor ... 329
wichmanni ... 327
amiciensis, Gobius ... 361
Kurtus ... 361
Amiidae ... 327
Amphacanthus notostictus ... 347
Theutis stellatus ... 347
Amphiprion arion ... 350
bicinctus ... 350
clarkii var. chrysargurus ... 350
chrysargyrus ... 350
ephippium ... 350
melanopus ... 350
percula ... 350
polymnus ... 350
sebae ... 350
tricolor ... 350
Amphisile strigata ... 324
Anampses caeruleo-punctatus ... 354
cuvier ... 354
pulcher ... 354
anema, Petroscirtes ... 313, 363
Anguilla australis ... 315
bengalensis ... 315
bicolor ... 315
fidjiensis ... 315
labiata ... 315
marmorata ... 315
mauritiana ... 315
obscura ... 315
sidat ... 315
virescens ... 315
anguillaris, Plotosus ... 318
anguillicaudatus, Misgurnus ... 318
anguinosus, Aluteres ... 366
angulata, Coris ... 355
angustifrons, Holocentrus ... 313, 323
annulata, Coris ... 356
annulatus, Naseus ... 346
Naso ... 347
Anomalopidae ... 321
Anomalops katoptron ... 321
Antennariidae ... 367
Antennarius bigibbus ... 367
commersonii ... 367
hispidus ... 367
marmoratus ... 367
multiocellatus ... 367
nigramaculatus ... 313
nigromaculatus ... 367
nummifer ... 367
antennata, Petrois ... 349
Antigonia capros ... 340
steindachneri ... 340
Antigonidae ... 340
antjerius, Glyphidodon ... 352
Glyphisodon ... 352
Anyperodon leucogrammicus ... 331
Aphareus furcatus ... 333
Aphthalmichthys abbreviatus ... 316
javanicus ... 316
microchir ... 316
apoda, Plesiops nigricans var. ... 332

PAGE
Apogon amboinensis 328
argyrogaster 329
fasciatus aroubiensis 327
aureus 328
auritus 328
bandanensis 327
beauforti 328
bleekeri 329
buroensis 329
ceramensis 328
cupreus 327
dammermani 328
endekataenia 328
fasciatus 327
frenatus 328
gjellerupi 327
graeffei 328
hartzfeldi 327
heurni 327
hyalosoma 328
hypselonotus 328
koilomatodon 327
lateralis 328
leptacanthus 328
lineolatus 329
maculosus 328
melas 328
monochrous 328
nematopterus 327
nigripinnis 328
novae-guineae 328
novemfasciatus 327
orbicularis 327
quadrifasciata 328
quadrifasciatus 328
sandei 327
sangiensis 328
savayensis 327
fasciata stevensi 327
fasciatus stevensi 327
taeniopterus 328
trifasciatus 327
trimaculatus 327
tubulatus 328
uramensis 328
wichmanni 327
zosterophorus 329
Apogonichthys auritus 329
gracilis 329
perdix 329
aporos, Eleotris 360
Ophiocara 360
Aprion virescens 332
Apsilus zonatus 332
arafurensis, Brachirus 321
arcatus, Cirrhites 339
Paracirrhites 339
Archamia 329
buruensis 329
gracilis 329
lineolata 329
zosterophora 329
arcticus, Galeocerdo 314
arcuatus, Cirrhites 339
Holacanthus 344
arenata, Thyrsoidea 317
arenatus, Salarias 363
arge, Upeneoides 336
argentea, Teuthis 347
argenteus, Dules 330
Monodactylus 340
Mugil 324
Psettus 340
Siganus 347
Terapon 334
Therapon 334
argentilineatus, Periophthalmus 363
argus, Halichoeres 355
Scatophagus 340
argyreus, Gerres 336
argyrogaster, Apogon 329
Siphamia 329

PAGE
argyromus, Myripristis 323
arion, Amphiprion 350
Arius armiger 318
thalassinus 318
armatus, Balistes 365
Caranx 326
armiger, Arius 318
Tachysurus 318
Arnoglossus macrolophus 320
tapeinosoma 320
Arothron testudinarius 367
aroubiensis, Amia 327
Apogon fasciatus 327
arsius, Pseudorhombus 320
aruanus, Dascyllus 351
ascensiones, Caranx 326
ascensionis, Caranx 326
Aseraggodes klunzingeri 320
melanostictus 320
persimilis 320
Aspasmogaster oro 313, 364
asperella, Sebastapistes 348
asperrima, Raja 314
asperrimus, Urogymnus 313, 314
aspilos, Brachirus 321
Synaptura 321
Asseraggodes 320
assimilis, Glyphidodon 353
Asterropterix semipunctatus 361
ater, Enchelyurus 364
Atherina eendrachtensis 324
endrachtensis 324
lacunosa 324
pinguis 324
Atherinidae 324
atra, Taeniura 314
atricauda, Clupea 315
atrocingulatus, Upeneus 337
atrodorsalis, Petroscirtes 363
auctorum, Lobotes 332
Aulostomidae 324
Aulostoma chinense 324
Aulostomus chinensis 324
auratus, Pagrosomus 335
Scomber 335
aureolus, Balistes 365
aureus, Apogon 328
auriflamma, Mulloidichthys 337
auriga, Chaetodon 343
auritus, Apogon 328
Apogonichthys 328
Scarichthys 359
aurolineatus, Pentapodus 335
Pentapus 335
australis, Anguilla 315
Muraena 315
axillaris, Stethojulis 354
azureus, Glyphidodon 352

B

baelama, Engraulis 315
bahiensis, Cypselurus 319
balinensis, Callyodon 360
Hemiramphus 319
Scarus 360
Balistapus aculeatus 365
rectangulus 365
undulatus 365
verrucosus 365
Balistes aculeatus 365
armatus 365
aureolus 365
buniva 365
(Melanichthys) buniva 365
bursa 364
chrysopterus 364
erythrodon 365
(Erythrodon) erythrodon 365
erythropterus 365
flavimarginatus 365
lineatus 365
maculatus 364

PAGE
niger 364
rectangulus 365
ringens 365
undulatus 365
verrucosus 365
vidua 364
viridescens 365
Balistidae 364
ballieni, Coris 355
Thalassoma 357
bandanensis, Amia 327
Apogon 327
Parascorpaena 348
bandatus, Sparus 358
barbatula, Nettostomops 317
barberinoides, Upeneus 336
barberinus, Upeneus 337
bariene, Hepatus 345
barracuda, Sphyraena 325
Bascanichthys pusillus 316
bataviensis, Callyodon 360
Pseudoscarus 360
Bathygobius fuscus 361
petrophilus 361
batjanensis, Ambassis 329
beauforti, Amia 328
Apogon 328
Belone carinata 319
crocodilus 319
depressa 319
liuroides 319
platyura 319
Belonidae 319
bengalensis, Abudefduf 352
Anguilla 315
Genyoroge 333
Glyphidodon 352
Glyphisodon 352
Symbranchus 315
Synbranchus 315
bennetti, Chaetodon 341
bennettii, Canthigaster 366
Tetrodon 366
biaculeatus, Gastrotokeus 323
Premnas 350
Syngnathoides 323
bicinctus, Amphiprion 350
bicolor, Anguilla 315
Exocoetus 319
Holacanthus 344
Ophichthys 316
bifasciatus, Heterognathodon 335
Pomacentrus 352
Upeneus 336
bifer, Julis 359
bigibbus, Antennarius 367
bilineatus, Scolopsis 334
bimacula, Cirrhitoidea 338
bimaculatus, Leptocephalus 316
binotopsis, Halichoeres 355
Platyglossus 335
biocellatus, Abudefduf 352
bipinnulatus, Elagatis 326
Seriolichthys 326
bipunctatus, Acanthurus 344
birostris, Manta 314
bleekeri, Hepatus 345
Holocentrum 322
Mesoprion 333
Paraplesiops 332
bleekerii, Apogon 329
Blenniidae 363
Blepharis ciliaris 326
blochii, Acanthurus 344
bohar, Mesoprion 333
Boleophthalmus viridis 363
bonaparti, Ophichthus 313, 316
bonapartii, Ophichthys 316
boops, Priacanthus 332
bostonensis, Genyoroge 333
Bostrichthys sinensis 360

PAGE
Bothus (Arnoglossus) poecilurus 320
(Platophrys) pantherinus 320
bottonensis, Genyoroge 333
Bowersia violescens 332
brachio, Synanceia 349
Brachirus arafurensis 321
aspilos 321
heterolepis 321
muelleri 321
mülleri 321
villosus 321
Brachyconger 316
Brachypleura novae-zeelandiae 320
brachyptera, Pterois 349
brachypterus, Dendrochirus 349
brachysoma, Rastrelliger 325
Brachysomophis crocodilinus 316
brachyurum, Doryrhamphinarum 323
brachyurus, Doryichthys 323
brasiliensis, Hemiramphus 319
Isistius 314
Bregmaceros macclellandi 320
mcclellandi 320
Bregmacerotidae 320
brevirostris, Naseus 346
Naso 346
brevis, Cirripectes 363
Dasyatis 314
Salarias 363
Brotula ensiformis 364
Brotulidae 364
brummeri, Muraena 317
Strophiodon 317
brunneus, Callyodon 359
buniva, Balistes 365
(Melanichthys) 365
Melanichthys 365
buroensis, Apogon 329
bursa, Balistes 364
buruensis, Archamia 329
buton, Ambassis 313, 329
bynoensis, Sebastapistes 349

C

Caecula bicolor 316
flavicauda 316
longipinne 316
caerulaureus, Caesio 334
caeruleo-lineatus, Plesiops 332
caeruleo-punctatus, Anampses 354
Serranus 331
caeruleus, Chromis 351
Caesio caerulaureus 334
cylindricus 313, 334
lunaris 334
maculatus 334
pisang 334
tile 334
calcarifer, Lates 330
Callicanthus lituratus 347
Callichelys filaria 316
Callyodon balinensis 360
bataviensis 360
brunneus 359
cyanognathus 360
dimidiatus 360
dubius 360
erythrodon 359
forsteri 360
genistriatus 359
ghobban 360
globiceps 360
guttatus 360
harid 360
janthochir 360
microcheilos 360
microrhinos 360
muricatus 360
nuchipunctatus 360
oviceps 360
perspicillatus 359
quoyi 360
rubroviolaceus 360
spinidens 359
spinus 360
Callyodontidae 359
canadum, Rachycentron 313, 327
canadus, Gasterosteus 327
canaliculatus, Siganus 347
cancellata, Scolopsis 334
Thyrsoidea 317
cancellatus, Scolopsis 334
cancrivorus, Ophichthys 316
Pisoodonophis 316
canescens, Zanclus 344
caninus, Gobius 361
Heterognathodon 335
canius, Pentapodus 335
Plotosus 318
Cantherines pardalis 366
Canthidermis maculatus 364
Canthigaster bennettii 366
cinctus 366
janthinopterus 367
valentini 366
Canthigasteridae 366
Canthogaster papua var. striolatus 367
cantoris, Eleotris 360
Caproidae 340
capros, Antigonia 340
Caracanthidae 349
Caracanthus maculatus 349, 350
unipinna 350
(Amphiprionichthys) unipinna 350
Carangichthys typus 313, 326
Carangidae 325
Carangoides armatus 326
ferdau 326
gymnostethus 326
oblongus 326
Caranx armatus 326
ascensiones 326
ascensionis 326
cheilio 326
ciliaris 326
crumenophthalmus 326
djeddaba 313, 326
ferdau 326
forsteri 326
gallus 327
hippos 326
ignobilis 326
kalla 326
leptolepis 326
lugubris 326
marginatus 326
mate 326
melampygos 326
melampygus 326
oblongus 326
parasitus 326
peronii 326
pinnulatus 326
sanctae-helenae 326
sexfasciatus 326
speciosus 326
Carapidae 364
Carapus homei 364
parvipinnis 364
carbunculus, Etelis 331
Carcharias acutus 314
dumerilii 314
(Scoliodon) dumerilii 314
melanopterus 314
(Prionodon) melanopterus 314
menisorrah 314
Carcharhinus melanopterus 314
carinata, Belone 319
carolinus, Priacanthus 332
casturi, Stethojulis 354
caudimaculatum, Holocentrum 321
caudimaculatus, Holocentrus 321
celebesensis, Muraena 315
centriquadrus, Halichoeres 354
Centriscidae 324
Centriscus strigatus 324
Centrogenys vaigiensis 330
Centrolophidae 325
cepedianus, Gomphosus 358
Cephalacanthidae 350
Cephalopholis argus 330
leopardus 331
miniatus 331
pachycentron 330
urodelus 331
cephalotes, Mugil 324
cephalozona, Ophichthus 316
Ophichthys 316
cephalus, Mugil 324
ceramensis, Amia 328
Apogon 328
Gobiodon 361
Ceratiidae 367
Ceratoptera 314
Cestraeus plicatilis 325
Chaetodon 341
auriga 343
bennetti 341
chrysopomus 340
chrysozonus 340
citrinellus 342
corallicola 341
dahli 342
dorsalis 342
ephippium 340
falcula 343
fremblii 341
humeralis 342
humereis 342
kleinii 343
lineolatus 342
lunula 343
melannotus 342
mertensii 342
meyeri 340
miliaris 342
ocellatus 340
ornatissimus 340
oxycephalus 343
pelewensis 342
pictus 342
pinnatus 340
punctato-fasciatus 342
quadrimaculatus 342
rafflesii 343
rafflessi 343
reticulatus 342
selene 342
semeion 341
setifer 342
sphenospilus 342
strigangulus 343
triangulum 343
trifascialis 343
trifasciatus 340
unimaculatus 342
vagabundus 342
vittatus 340
Chaetodontidae 340
Chandidae 329
Chanidae 315
Chanos chanos 315
orientalis 315
salmoneus 315
chanos, Chanos 315
Chaunax pictus 367
Cheilinus chlorurus 358
chlorusus 359
diagrammus 358
fasciatus 358
hexagonatus 358
nigropinnatus 358
oxycephalus 358
oxyrhynchus 359
radiatus 358
rivulatus 358
trilobatus 358
undulatus 358

PAGE
unifasciatus 358
cheilio, Caranx 326
Cheilio inermis 358
Cheilodactylus vittatus 337
Cheilodipteridae 327
Cheilodipterus lineatus 329
macrodon 329
quinquelineatus 329
singapurensis 329
Chelidonichthys kumu 350
Chelmo longirostris 340
Chilodipterus lineatus 329
octovittatus 329
quinquelineatus 329
Chilomycterus affinis 367
Chiloscyllium ocellatum 314
chinense, Aulostoma 324
chinensis, Aulostomus 324
Monacanthus 366
Chirocentridae 315
Chirocentrus dorab 313, 315
vorax 315
chloropterus, Halichoeres 355
Platyglossus 355
chlorurus, Cheilinus 358
chlorusus, Cheilinus 359
Chonophorus genivittatus 362
guamensis 362
ocellaris 362
Chorinemus sancti-petri 325
toloo 325
Chromis caeruleus 351
dimidiatus 351
iomelas 351
leucurus 351
ovalis 351
ternatensis 351
velox 351
verater 351
chrysargurus, Amphiprion clarkii var. 350
chrysargyrus, Amphiprion clarkii var. 350
chryserydros, Upeneus 337
chryserythrus, Upeneus 337
chrysonemus, Pseudupeneus 337
Upencus 313, 337
chrysopomus, Chaetodon 340
chrysopterus, Balistes 364
chrysostoma, Heniochus 343
chrysozonus, Chaetodon 340
Coradion 340
ciliaris, Blepharis 326
Caranx 326
ciliata, Scolopsis 334
ciliatus, Scolopsis 334
cincta, Pterois 349
cinctus, Canthigaster 366
Paracirrhites 340
cinerascens, Kyphosus 335
cinereus, Conger 316
Therapon 334
Cirrhites arcatus 339
arcuatus 339
forsteri 339
forsterii 339
maculatus 338
punctatus 338
Cirrhitichthys oxycephalus 339
oxyrhynchus 339
Cirrhitidae 337
Cirrhitoidea bimacula 338
Cirrhitus oxycephalus 339
oxyrhynchos 338
pinnulatus 338
cirrhosa, Scorpaena 348
cirrhosus, Scorpaenopsis 348
Cirripectes brevis 363
variolosus 363
citrinellus, Chaetodon 342
citrinus, Gobiodon 361
Clarias magur 318
Clariidae 318

PAGE
Clupea atricauda 315
fimbriata 315
notacanthus 315
punctata 315
tembang 315
venenosa 315
zeunasi 315
zunasi 315
Clupeidae 315
clupeiformis, Rhabdamia 329
Clupeoides papuensis 315
Clupeonia commersonii 315
Cobitidae 318
coelestinus, Glyphidodon 352
Coelonotus liaspis 323
cocrulcopunctatus, Scarichthys 359
colonorum, Percalates 330
colonus, Serranus hexagonatus var 331
colubrinus, Leiuranus 316
Myrichthys 316
Ophichthys 316
commersoni, Ambassis 329
commersonii, Ambassis 329
Antennarius 367
Clupeonia 315
Sphyraena 325
concatenata, Teuthis 347
concatenatus, Siganus 347
concolor, Ginglymostoma 314
Uropterygius 318
confinis, Ambassis 330
Conger cinereus 316
marginatus 316
multidens 316
orbignyanus 313, 316
Congridae 316
conorhynchus, Albula 315
conspicillatus, Corythoichthys 324
Syngnathus 324
Coradion chrysozonus 340
corallicola, Chaetodon 341
Plesiops 332
Serranus 331
Coris angulata 355
annulata 356
ballieui 355
flavovittata 356
gaimard 356
gaimardi 356
gaimardii 356
pulcherrima 356
venusta 355
cornutus, Ostracion 366
Zanclus 344
Corvina fasciata 337
Coryphaena hippurus 325
Coryphaenidae 325
Coryphaenoididae 320
Corythoichthys conspicillatus 324
crapao, Serranus 331
crassilabris, Gobius 362
Hemipimelodus 318
crassispinum, Diagramma 334
Crayracion nigropunctatus 367
crenilabis, Mugil 324
crenilabris, Mugil 324
crocodila, Strongylura 319
crocodilinus, Brachysomophis 316
Ophichthys 316
crocodilus, Belone 319
Platycephalus 350
Thysanophrys 350
cruenta, Scorpaena 348
cruentatus, Gobius 361
Priacanthus 332
crumenophthalmus, Caranx 326
Selar 326
Ctenochaetus ctenodon 344
striatus 344
strigosus 344
ctenodon, Acanthurus 344
Ctenochaetus 344

cubicus, Ostracion 366
cuculus, Trigla 350
cupreus, Apogon 327
curacao, Abudefduf 352
cuvier, Anampses 354
cuvieri, Therapon 334
cuvierii, Therapon 334
cyaneus, Abudefduf 352
cyanognathus, Callyodon 360
Pseudoscarus 360
cyanospilus, Glyphidodon 351
Glyphisodon 351
Pomacentrus 351
cyanotis, Holacanthus 344
cyclostoma, Upeneus 337
cylindrica, Parapercis 363
Percis 363
cylindricus, Caesio 313, 334
Cynoglossus heterolepis 321
kopsi 321
kopsii 321
cyprinoides, Hypseleotris 361
Megalops 314
cyprinus, Eleotris 361
Cypselurus bahiensis 319
nigricans 319
ogilbyi 319
oxycephalus 319
rubescens 319
simus 319
spilonotopterus 319
Cypsilurus unicolor 319

D

Dactyloptena orientalis 350
Dactylopterus orientalis 350
dahli, Chaetodon 342
dammermani, Amia 313, 328
Apogon 328
Dascyllus aruanus 351
marginatus 351
melanurus 351
polyacanthus 351
trimaculatus 350
xanthosoma 351
Dasyatidae 314
Dasyatis brevis 314
granulatus 313, 314
kuhlii 314
sephen 314
dayi, Hemipimelodus 318
Nedystoma 318
Decapterus sanctae-helenae 326
decemradiatus, Mugil 324
delicatulus, Spratelloides 315
Stolephorus 315
Dendrochirus brachypterus 349
zebra 349
Dentex furcosus 313, 335
gracilis 313, 335
depressa, Belone 319
Fistularia 324
diabolus, Scorpaena 348
diacanthus, Holacanthus 344
Diacope notata 333
octolineata 333
diadema, Holocentrum 322
Holocentrus 322
Diagramma crassispinum 334
giganteum 334
lessonii 334
diagramma, Plectorhinchus 334
diagrammus, Cheilinus 358
diaphanus, Ostracion 366
dickii, Abudefduf 352
Glyphidodon 352
Dimalacocentrus 359
dimidiatus, Callyodon 360
Chromis 351
Pseudoscarus 360
diploxyphus, Holocentrum 321
dispar, Zenarchopterus 319
dispilurus, Mullus 337

PAGE
djeddaba, Caranx 313
Scomber 326
doliata, Teuthis 347
doliatus, Siganus 347
dorab, Chirocentrus 313, 315
dorsalis, Chaetodon 342
Julis 356
Doryichthys brachyurus 323
pleurotaenia 323
Doryrhamphinarum brachyurum 323
Doryrhamphus melanopleura 323
Drepane punctatus 340
Drombus filamentosus 362
whitleyi 313, 362
dubius, Callyodon 360
ductor, Naucrates 326
Duleidae 330
Dules argenteus 330
malo 330
marginatus 330
munda 330
mutabunda 330
rupestris 330
sandvicensis 330
taeniurus 330
dumerilii, Carcharias 314
(Scoliodon) 314
Scoliodon 313, 314
Seriola 325
duperrey, Thalassoma 357
dussumieri, Ambassis 329
Hemiramphus 319
Hemirhamphus 319
dussumierii, Ambassis 329
Hemirhamphus 319

E

Echelidae 316
Echeneidae 363
Echeneis lineata 363
remora 363
Echidna amblyodon 317
nebulosa 317
polyzona 316
variegata 317
zebra 316
Echidnidae 316
echinocephalus, Kurtus 361
Paragobiodon 361
Echinorhinidae 314
edentulus, Salarias 364
eendrachtensis, Atherina 324
ehrenbergii, Lutjanus 313
Mesoprion 333
Elagatis bipinnulatus 326
elegans, Gobius 361
Microsicydium 361
Eleotridae 360
Eleotris aporos 360
cantoris 360
cyprinus 361
fusca 360
guentheri 361
gyrinoides 360
hoedtii 360
macrolepidota 360
marmorata 360
melanosoma 361
muralis 361
ophicephalus 360
oxycephala 361
porocephaloides 360
(Asterropteryx) semipunctatus 361
sinensis 360
strigata 361
elongata, Teuthis 344
elongatus, Hepatus 344
Petroscirtes 363
Elopidae 314
Elops hawaiensis 314
Emmelichthyidae 336

PAGE
Enchelynassa canina 318
rhinechidna 318
Enchelyurus ater 364
encrasicholoides, Engraulis 315
Endeconger 316
platyrhynchus 316
endekataenia, Amia 313, 328
Apogon 328
endrachtensis, Atherina 324
engeli, Mugil 324
Engraulidae 315
Engraulis baelama 315
encrasicholoides 315
Enneapterygius hemimelas 363
ensiformis, Brotula 364
eoume, Naso 347
Ephippidae 340
ephippium, Amphiprion 350
Chaetodon 340
Epibulus insidiator 353
Epinephelus fuscoguttatus 331
maculatus 331
merra 331
pantherinus 331
socialis 331
stellans 331
Equula fasciata 327
filigera 327
equula, Leiognathus 327
eritomia, Rhinomuraena 317
erythraeum, Holocentrum 321
erythraeus, Holocentrus 321
Erythrichthyidae 336
Erythrichthys 336
erythrinus, Mulloidichthys 337
Erythrocles 336
schlegelii 336
erythrodon, Balistes 365
(Erythrodon) 365
Callyodon 359
Odonus 365
Pseudoscarus 359
erythropterus, Balistes 365
erythrorinchus, Hemiramphus 319
Etelis carbunculus 333
marshi 333
Ethmidium maculatum 315
euanus, Sphaerodon 335
Euelatichthys obscurus 334
Eulamia melanopterus 314
menisorrah 314
Eulamiidae 314
Euthynnus alletteratus 325
pelamis 325
evolans, Exocoetus 319
Exocoetidae 319
Exocoetus bicolor 319
evolans 319
lamellifer 319
obtusirostris 319
volitans 319
exostigma, Amia 313, 328

F

falcatus, Trachinotus 327
falcula, Chaetodon 343
far, Hemiramphus 319
fasciata, Corvina 337
fasciatus, Apogon 327
Cheilinus 358
Equula 327
Hemigymnus 354
Leiognathus 327
Ophisurus 316
Salarias 363
Serranus 331
favaginea, Lycodontis 318
favagineus, Gymnothorax 318
faveatus, Serranus 331
ferdau, Caranx 326
ferox, Isistius 314
Leius 314

PAGE
ferrugineum, Ginglymostoma 314
fidjiensis, Anguilla 315
Fierasfer parvipinnis 364
filamentosus, Drombus 362
Gerres 336
Gobius 362
Petroscirtes 363
filaria, Callichelys 316
Ophichthys 316
filigera, Equula 327
fimbriata, Clupea 315
Muraena 317
Spratella 315
fisheri, Holacanthus 344
Fistularia depressa 324
petimba 324
serrata 324
tabaccaria 324
Fistulariidae 324
flavescens, Zebrasoma 346
flavicauda, Caecula 316
flaviroseus, Mesoprion 333
flavissimus, Holacanthus 344
flavolineatus, Mulloides 337
flavomarginata, Lycodontis 317
Muraena 317
flavovittata, Coris 356
fleurieu, Amia 328
foliatus, Hippocampus 313, 324
Forcipiger longirostris 340
fornasini, Ostracion 366
forsteri, Callyodon 360
Caranx 326
Cirrhites 339
Paracirrhites 337
forsterii, Cirrhites 339
fraterculus, Upeneus 337
fremblii, Chaetodon 341
frenata, Amia 328
frenatus, Apogon 328
Gobius 361
fuliginosus, Acanthurus 344
Hepatus 344
furcatus, Aphareus 333
Holocentrus 322
furcosus, Dentex 313, 335
fusca, Amia 328
Eleotris 360
fuscescens, Siganus 347
fuscipinnis, Odontanthias 331
fuscoguttatus, Serranus 331
fuscus, Acanthistius 330
Bathygobius 361
Kyphosus 335
Pimelepterus 335
Pseudochromis 332
Salarias 363

G

gahm, Acanthurus 345
gaimard, Coris 356
gaimardi, Coris 356
gaimardii, Coris 356
galactacma, Sebastapistes 348
galena, Scarus 360
Galeocerdo arcticus 314
tigrinus 314
Galeorhinidae 314
gallus, Caranx 327
Gasterosteus canadus 327
serratus 324
Gasterotokeus aculeatus 323
Gastrophysus oblongus 367
Gastrotokeus biaculeatus 323
Gazza minuta 327
gembra, Mesoprion 333
genistriatus, Callyodon 359
genivittatus, Chonophorus 362
Gobius 362
Genyoroge bengalensis 333
bostonensis 333
bottonensis 333

PAGE
gibba 333
macolor 333
marginata 333
notata 333
geoffroy, Macropharyngodon 355
geoffroyi, Platyglossus 355
geoffroyii, Platyglossus 355
Geophagus olfersi 350
Germo alalunga 325
macropterus 325
sibi 325
Gerres amboinensis 336
argyreus 336
filamentosus 336
gigas 336
kapas 336
macracanthus 336
macrosoma 336
oyena 336
punctatus 336
rhombeus 336
Gerridae 336
ghanam, Scolopsis 334
ghobban, Callyodon 360
Pseudoscarus 360
gibbifrons, Salarias 364
gibbosa, Scorpaena 348
gibbosus, Scorpaenopsis 348
gibbus, Mesoprion 333
giganteum, Diagramma 334
gigas, Ambassis 329
Gerres 336
Ginglymostoma concolor 314
ferrugineum 314
Girella nebulosa 335
Girellidae 335
Girellops nebulosus 335
gjellerupi, Amia 313, 327
Apogon 327
gladius, Xiphias 325
glaucopareius, Acanthurus 345
Hepatus 345
glaucus, Abudefduf 352
globiceps, Callyodon 360
Pseudoscarus 360
Glyphidodon albofasciatus 353
antjerius 352
assimilis 353
azureus 352
bengalensis 352
coelestinus 352
cyanospilus 351
dickii 352
lacrymatus 352
leucopoma 353
leucozona 353
modestus 353
plagiometopon 353
septemfasciatus 352
7-fasciatus 352
trifasciatus 352
unicellatus 353
unifasciatus 352
uniocellatus 353
waigiensis 351
coelestinus var. waigiensis 352
xanthozona 353
Glyphisodon amabilis 353
antjerius 352
bengalensis 352
cyanospilus 351
hemimelas 352
leucozona 352
modestus 352
septemfasciatus 352
sordidus 352
uniocellatus 353
zonatus 353
Gnathanodon leptolepis 326
speciosus 326
Gnatholepis puntang 361
Gobiesocidae 364
Gobiichthys papuensis 363

PAGE
Gobiidae 361
Gobiodon ceramensis 361
citrinus 361
histrio 361
quinque-strigatus 361
rivulatus 361
verticalis 361
Gobiosoma punctularum 363
Gobius amiciensis 361
caninus 361
crassilabris 362
cruentatus 361
echinocephalus 361
elegans 361
filamentosus 362
frenatus 313, 361
genivittatus 362
hensbyi 361
jozo 361
neophytus 362
ocellaris 362
petrophilus var. ocellata 362
ocellatus 362
ophthalmotaenia 363
petrophilus 361
phalaena 362
pictus 361
puntangoides 361
sadanundio 361
semicinctus 363
semidoliatus 363
soporator 361
goldiei, Rhombosoma 324
Gomphosus cepedianus 358
pectoralis 357
tricolor 358
varius 357
gracilis, Apogonichthys 329
Archamia 329
Dentex 313, 335
Jordanicus 364
Saurida 319
Smaris 335
Spratelloides 315
graeffei, Apogon 328
graeffii, Aboma 362
Mionorus 328
Zoramia 328
Grammistes orientalis 331
sexlineatus 331
grandoculis, Monotaxis 335
Sphaerodon 335
granulata, Himantura 314
Trygon 314
granulatus, Dasyatis 313, 314
Rhinobatos 314
Rhinobatus 314
griseus, Mesoprion 333
Salarias 364
guamensis, Chonophorus 362
Scorpaena 349
Scorpaenodes 349
Guavina gyrinoides 360
guentheri, Eleotris 361
güntheri, Homalogrystes 351
Julis 356
Güntheria trimaculata 354
guttata, Paraplagusia 321
Plagusia 321
guttatus, Acanthurus 345
Callyodon 360
Hepatus 345
Platyglossus 355
Salarias 364
Serranus 331
Symphurus 321
guttulatus, Hippocampus 324
Gymnapistus vestitus 349
gymnocephalus, Ambassis 329
Lutjanus 329
gymnognathus, Pseudoscarus 359
Gymnomuraena marmorata 318
tigrina 318

PAGE
gymnostethus, Carangoides 326
Gymnothorax obscurirostris 317
favagineus 318
hepatica 318
isingleena 318
macassariensis 318
nubila 318
petelli 317
pictus 317
reevesi 318
reticulatus 317
richardsoni 318
tessellata 318
thyrsoidea 317, 318
xanthopleura 318
zonipectus 318
gyrinoides, Eleotris 360
Guavina 360

H

halmaherensis, Muraena 315
Halichoeres argus 355
binotopis 355
centriquadrus 354
chloropterus 355
hoevenii 355
macleayi 355
margaritaceus 355
marginatus 355
melanurus 355
miniatus 355
nebulosus 355
notopsis 355
ornatissimus 355
papilionaceus 355
pseudominiatus 355
scapularis 354
trimaculatus 354
hamiltoni, Sphoeroides 367
hamiltonii, Tetrodon 367
hamrur, Priacanthus 332
haplodactylus, Scorpaena 348
hardwicke, Thalassoma 356
Harengula punctata 315
vittata 315
harid, Callyodon 360
Pseudoscarus 360
hartzfeldi, Achirus 320
Apogon 327
hartzfeldii, Amia 327
hasselti, Salarias 364
hasseltii, Salarias 313, 364
hawaiiensis, Elops 314
Heliastes lepidurus 351
ovalis 351
hellmuthii, Pentapodus 335
Pentapus 335
Hemiglyphidodon plagiometopon 353
Hemigymnus fasciatus 354
melanopterus 354
melapterus 354
hemimelas, Enneapterygius 363
Glyphisodon 352
Tripterygium 363
Hemipimelodus crassilabris 318
dayi 318
Hemipteronotus melanopus 359
Hemiramphidae 319
Hemiramphus balinensis 319
brasiliensis 319
dussumieri 319
erythrorinchus 319
far 319
Hemirhamphus dussumieri 319
dussumierii 319
intermedius 319
Hemiscyllium ocellatus 314
Heniochus acuminatus 343
chrysostoma 343
macrolepidotus 343
monoceros 343
permutatus 343
varius 343

PAGE
hensbyi, Gobius 361
hepatica, Gymnothorax 318
Lycodontis 318
Muraena 318
Hepatidae 344
hepatus, Acanthurus 344
Hepatus achilles 345
bariene 345
bleekeri 345
elongatus 344
fuliginosus 344
glaucopareius 345
guttatus 345
leucopareius 345
leucosternon 345
lineatus 345
lineolatus 345
maculiceps 345
nigricans 345
olivaceus 345
triostegus 345, 346
Hepsetia insularum 324
lacunosa 324
pinguis 324
heterochira, Solea 321
heterochisma, Solea 321
Heterognathodon bifasciatus 335
caninus 335
xanthopleura 335
heterolepis, Brachirus 321
Cynoglossus 321
heterorhina, Solea 321
heterorhinos, Soleichthys 321
heurni, Amia 313, 327
Apogon 327
hexacanthus, Naso 347
hexagonatus, Cheilinus 358
Serranus 331
Teuthis 347
hexagonus, Myripristis 323
hexataenia, Pseudocheilinus 358
hexophthalma, Parapercis 363
Percis 363
hians, Ablennes 319
Myctophum 313, 319
Himantura granulata 314
hinsbyi, Parachaeturichthys 361
Hippocampus foliatus 313, 324
guttulatus 324
kuda 324
novae-hollandiae 324
hippos, Caranx 326
hippurus, Coryphaena 325
hispidus, Antennarius 367
Tetraodon 367
Tetrodon 367
histrio, Gobiodon 361
Histrio 367
Histrio histrio 367
hoedtii, Eleotris 360
Novacula 359
Ophiocara 360
hoeveni, Platyglossus 355
hoevenii, Halichoeres 355
Serranus 331
Holacanthus arcuatus 344
bicolor 344
cyanotis 344
diacanthus 344
fisheri 344
flavissimus 344
imperator 344
nicobariensis 344
potteri 344
semicirculatus 344
trimaculatus 344
vrolikii 344
Holocentridae 321
Holocentrum bleekeri 322
caudimaculatum 321
diadema 322
diploxyphus 321
erythraeum 321

PAGE
lacteoguttatum 321
laeve 322
microstoma 322
operculare 322
punctatissimum 321
rubrum 321
sammara 322
spiniferum 322
tahiticum 322
tiereoides 321
violaceum 322
Holocentrus angustifrons 313, 323
caudimaculatus 321
diadema 322
erythraeus 321
furcatus 322
lacteoguttatus 321
laevis 322
laticeps 322
malabaricus 331
microstomus 322
opercularis 322
punctatissimus 321
quadrilineatus 334
ruber 321
spinifer 322
tiereoides 321
violaceus 322
xantherythrus 322
Hologymnosus semidiscus 356
holomelas, Salarias 363
Holotrachys lima 323
Homalogrystes 351
güntheri 351
homei, Carapus 364
hortulanus, Platyglossus 354
humbavensis, Pseudoscarus 359
humeralis, Chaetodon 342
humereis, Chaetodon 342
hyalosoma, Amia 328
Apogon 328
hyans, Myctophum 319
Hymenocephalus longibarbus 313, 320
Hypseleotris cyprinoides 361
vanicolensis 361
hypselogenion, Tetrodon 367
hypselonota, Amia 328
hypselonotus, Apogon 328
hypselopterus, Acanthurus 345

I

Ichthyophis tigrinus 318
ignobilis, Caranx 326
immaculatus, Tetrodon (Arothron) 367
imperator, Holacanthus 344
incisa, Strongylura 319
indica, Scyris 327
Strongylura 319
indicus, Neucrates 326
Pseudupeneus 337
Upeneus 337
inermis, Cheilio 358
Iniistius pavo 359
inornatus, Pomacentrus 352
inscriptus, Pseudolabrus 357
insidiator, Epibulus 353
insularum, Hepsetia 324
Tetrodon 367
intermedius, Hemirhamphus 319
interrupta, Ambassis 329
Ioamia 329
iomelas, Chromis 351
isingleena, Gymnothorax 318
Isistius brasiliensis 314
ferox 314
Istiophoridae 325

J

jacobus, Myripristis 323
jaculator, Toxotes 340
jansenii, Julis 356
Thalassoma 356

PAGE
janthinopterus, Canthigaster 367
Tetrodon 367
janthochir, Pseudoscarus 360
japonicus, Platycephalus 350
Scomber 325
Stolephorus 315
Synodus 318
Thysanophrys 350
jarbua, Terapon 334
javanica, Moringua 316
javanicus, Aphthalmichthys 316
Jordanicus gracilis 364
parvipinnis 364
jozo, Gobius 361
Julis amblycephalus 357
bifer 359
dorsalis 356
güntheri 356
jansenii 356
lunaris 356
melanochirus 357
quadricolor 356
semidecorata 355
trilobata 356
trilobatus 356
umbrostigma 356
umbrostygma 356
jussieu, Sardinella 315

K

kalla, Caranx 326
kallosoma, Novacula 359
Petroscirtes 363
kampeni, Zenarchopterus 319
kanagurta, Scomber 325
kandavensis, Mugil 324
kapas, Gerres 336
katoptron, Amomalops 321
kelaartii, Mugil 324
kelaertii, Mugil 324
Keris amboinensis 346
maculatus 346
kleinii, Chaetodon 343
klunzingeri, Aseraggodes 320
koelreuteri, Periophthalmus 363
koelreuterii, Periophthalmus 363
koilomatodon, Amia 327
Apogon 327
kölreuteri, Periophthalmus 363
kopsi, Cynoglossus 321
kopsii, Cynoglossus 321
kuda, Hippocampus 324
Kuhlia marginata 330
munda 330
mutabunda 330
rupestris 330
kuhlii, Dasyatis 314
Trygon 314
Kuhliidae 330
kumu, Chelidonichthys 350
Trigla 350
Kurtus amiciensis 361
echinocephalus 361
Kyphosidae 335
Kyphosus cinerascens 335
fuscus 335
lembus 335
vaigiensis 336

L

labialis, Muraenichthys 316
labiata, Anguilla 315
Labrichthys cyanotaenia 353
fuentesi 357
semifasciatus 353
Labridae 353
Labroides dimidiatus 354
quadrilineatus 354
lacrymatus, Abudefduf 352
Glyphidodon 352
lacteoguttatum, Holocentrum 321
lacteoguttatus, Holocentrus 321

PAGE
lacunosa, Atherina 324
Hepsetia 324
laddi, Rhinogobius 313, 362
laeve, Holocentrum 322
laevis, Aluteres 366
Holocentrus 322
lagocephalum, Sicydium 361
lamellifer, Exocoetus 319
lanceolatus, Promicrops 331
Serranus 331
latcrale, Amia 328
lateralis, Apogon 328
laterna, Tetrodon hispidus var. 367
laticeps, Holocentrus 322
Lates calcarifer 330
latifrons, Pentapus 332
latovittatus, Malacanthus 337
Leiognathidae 327
Leiognathus equula 327
fasciatus 327
Leiuranus colubrinus 316
semicinctus 316
Leius ferox 314
lembus, Kyphosus 335
lentiginosum, Ostracion 366
leopardus, Cephalopholis 331
Serranus 331
Lepidaplois bilunulatus 353
modestus 353
lepidurus, Heliastes 351
leptacantha, Amia 328
leptacanthus, Apogon 328
Leptocephalus bimaculatus 316
multimaculatus 316
tacnia 316
Leptojulis pardalis 355
leptolepis, Caranx 326
Gnathanodon 326
Leptonotus semistriatus 324
Leptoscarus viagiensis 359
lessonii, Diagramma 334
Lethrinidae 334
Lethrinus bonhamensis 335
harak 335
leutjanus 335
mahsena 334
mahsenoides 335
masena 334
mashenoides 335
miniatus 335
moensii 334
nebulosus 335
ramak 335
reticulatus 334
leucogrammicus, Anyperodon 331
leucopareius, Hepatus 345
leucopoma, Glyphidodon 353
leucopomus, Abudefduf 353
leucosternon, Hepatus 345
leucozona, Glyphidodon 353
Glyphisodon 352
leucozonus, Abudefduf 352
leucurus, Chromis 351
liaspis, Coelonotus 323
lima, Holotrachys 323
Myripristis 323
lineata, Echeneis 363
lineatus, Acanthurus 345
Cheilodipterus 329
Chilodipterus 329
Hepatus 345
Phtheirichthys 363
Salarias 364
Siganus 347
Teuthis 345
lineolata, Archamia 329
lineolatus, Chaetodon 342
Hepatus 345
Lionurus microlepis 313, 320
lituratus, Callicanthus 347
Naseus 346
Naso 347
liuroides, Belone 319

PAGE
lividus, Pomacentrus 351
Liza melinoptera 324
vaigiensis 324
Lo vulpinus 348
Lobotes auctorum 332
surinamensis 332
longibarbis, Hymenocephalus 320
Macrurus 320
longibarbus, Hymenocephalus 313
longifilis, Petroscirtes 363
longipinne, Caecula 316
longipinnis, Sphagebranchus 316
Valenciennea 361
longirostris, Chelmo 340
Forcipiger 340
Monacanthus 366
Oxymonacanthus 366
louti, Serranus 330
Variola 330
lumbricoidea, Moringua 316
lunare, Thalassoma 356
lunaris, Caesio 334
Julis 356
lunula, Chaetodon 342
lutescens, Thalassoma 357
luteus, Upeneus 337
Lutjanidae 332
Lutjanus argentimaculatus 333
biguttatus 333
bohar 333
caudalis 333
ehrenbergii 313, 333
flavipes 333
fulviflamma 333
gibbus 333
gymnocephalus 329
kasmira 333
marginatus 333
monostigma 333
niger 333
semicinctus 333
vaigiensis 333
vitta 333
Lycodontis favaginca 318
flavomarginata 317
hepatica 318
makassariensis 313, 318
meleagris 317
nubila 318
parvibranchialis 317
petelli 317
picta 317
polyuranodon 317
reevesii 318
richardsonii 318
ruppelli 317
thyrsoidea 317
undulata 317
lymma, Taeniura 314

M

macassariensis, Gymnothorax 318
Muraena 318
macclellandi, Bregmaceros 320
macleayi, Halichoeres 355
macolor, Genyoroge 333
macracanthus, Gerres 336
Priacanthus 332
Trachypoma 330
macrocephala, Merinthe 349
macrodon, Cheilodipterus 329
macrolepidota, Eleotris 360
macrolepidotus, Heniochus 343
Ophiocara 360
macrolepis, Mugil 324
macrolophus, Arnoglossus 320
macronemus, Upeneus 337
Macropharyngodon geoffroy 355
macropterus, Germo 325
Muraenichthys 313, 316
Neothunnus 325
macrosoma, Gerres 336
Macrurus longibarbis 320

PAGE
microlepis 320
maculatum, Ethmidium 315
maculatus, Balistes 364
Caesio 334
Canthidermis 364
Caracanthus 349, 350
Cirrhites 338
Epinephelus 331
Keris 346
Micropus 349
Plectropomus 330
Schedophilus 325
Serranus 331
maculiceps, Hepatus 345
maculosa, Amia 328
maculosus, Apogon 328
Myrichthys 316
Ophichthys 316
Scarus 360
magur, Clarias 318
makassariensis, Lycodontis 313
malabaricus, Holocentrus 331
Serranus 313, 331
Upeneus 337
Malacanthus latovittatus 337
malleus, Zygaena 314
malo, Dules 330
mancus, Platophrys 320
mangula, Pempheris 332
Manta birostris 314
mappa, Tetrodon 367
margaritaceus, Halichoeres 355
margaritatus, Tetrodon 366
(Ansomius) 367
margaritifer, Syngnathus 313, 323
marginata, Genyoroge 333
Kuhlia 330
marginatus, Caranx 326
Conger 316
Dascyllus 351
Dules 330
Halichoeres 355
Naseus 346
Nemipterus 335
Platyglossus 355
marmorata, Anguilla 315
Eleotris 360
Gymnomuraena 318
Oxyeleotris 360
Teuthis 347
marmoratus, Antennarius 367
Salarias 363
Schedophilus 325
Uropterygius 318
marshi, Etelis 333
mate, Caranx 326
matoides, Acanthurus 344
mauritiana, Anguilla 315
Muraena 315
mcclellandi, Bregmaceros 320
Megalops cyprinoides 314
megalurus, Monacanthus 366
Megaprotodon 341
strigangulus 343
meieri, Tetragonopterus 340
melampygos, Caranx 326
melampygus, Caranx 326
melannotus, Chaetodon 342
melanochir, Thalassoma 357
melanochirus, Julis 357
melanopleura, Doryrhamphus 323
melanopterus, Carcharhinus 314
Carcharias 314
(Prionodon) 314
Eulamia 314
Hemigymnus 354
Pomacentrus 351
melanopus, Amphiprion 350
Hemipteronotus 359
melanosoma, Eleotris 361
melanostictus, Aseraggodes 320
Melanotaenia nigrans 324
melanotus, Paracirrhites 340

PAGE
Pomacentrus 351
melanura, Sardinella 315
melanurus, Dascyllus 351
Halichoeres 355
Platyglossus 355
melapterus, Hemigymnus 354
melas, Amia 313, 328
Apogon 328
Plesiops 313, 331
meleagris, Lycodontis 317
Muraena 317
Ostracion 366
Salarias 364
Tetrodon 367
Melichthys buniva 365
melinoptera, Liza 324
menisorrah, Carcharias 314
Eulamia 314
Merinthe macrocephala 349
merra, Epinephelus 331
Serranus 331
mertensii, Chaetodon 342
Mesoprion bleekeri 333
bohar 333
ehrenbergii 333
flaviroseus 333
fulviflamma 333
gembra 333
gibbus 333
griseus 333
monostigma 333
semicinctus 333
meyeri, Chaetodon 340
Microbuglossus nigrostriolatus 321
Microcanthus strigatus 343
microcheilos, Callyodon 360
Scarus 360
microchir, Aphthalmichthys 316
microdon, Pristipomoides 332
microlepidotus, Scomber 325
microlepis, Lycodontis 313
Macrurus 320
Pristipomoides 332
microphthalmus, Myripristis 323
Micropus maculatus 349
unipinna 350
microrhinos, Callyodon 360
microrhinus, Pseudoscarus 360
Microsicydium elegans 361
microspila, Muraena 318
microstoma, Holocentrum 322
microstomus, Holocentrus 322
miliaris, Chaetodon 342
militaris, Scorpaena 348
miniatus, Cephalopholis 331
Halichoeres 355
Platyglossus 355
miniatus, Serranus 331
minuta, Gazza 327
Mionorus graeffii 328
waikiki 328
miops, Ambassis 329
Misgurnus anguillicaudatus 318
mitratus, Petroscirtes 363
mitsukurii, Tetrapturus 325
moana, Pseudupeneus 336
Upeneus 336
modestus, Glyphidodon 353
Glyphisodon 352
Monacanthidae 366
Monacanthus chinensis 366
longirostris 366
megalurus 366
pardalis 366
spilosoma 366
pardalis var. rüppellii 366
tetragonus 366
tomentosus 366
monoceros, Alutera 366
Aluteres 366
Heniochus 343
monochrous, Apogon 328
Monodactylidae 340
Monodactylus argenteus 340
monogramma, Scolopsis 334
monostigma, Mesoprion 333
Monotaxis grandoculis 335
Moringua abbreviata 316
javanica 316
lumbricoidea 316
Moringuidae 316
muelleri, Brachirus 321
Mugil argenteus 324
cephalotes 324
cephalus 324
crenilabis 324
crenilabris 324
decemradiatus 324
engeli 324
kandavensis 324
kelaartii 324
kelaertii 324
macrolepis 324
peronii 313, 324
perusii 324
seheli 324
tade 324
troscheli 324
vaigiensis 324
Mugilidae 324
mülleri, Brachirus 321
Synaptura 321
Mullidae 336
Mulloides flavolineatus 337
ruber 337
samoensis 337
vanicolaris 337
vanicolensis 337
Mulloidichthys auriflamma 337
erythrinus 337
samoensis 337
vanicolensis 337
Mullus dispilurus 337
pleurotaenia 337
trifasciatus 336
multidens, Conger 316
multifasciatus, Rhinogobius 362
Upeneus 336
multimaculatus, Leptocephalus 316
Pseudorhombus 313, 320
Rhomboidichthys 320
multiocellatus, Antennarius 367
multiradiatus, Myripristis 323
munda, Dules 330
Kuhlia 330
Muraena picta var. albicans 317
amblyodon 317
australis 315
brummeri 317
celebesensis 315
fimbriata 317
flavomarginata 317
halmaherensis 315
hepatica 318
macassariensis 318
mauritiana 315
meleagris 317
microspila 318
nebulosa 317
nebula 318
petelli 317
picta 317
polyuranodon 317
polyzona 316
reevesi 318
reticularis 317
richardsoni 318
tessellata 318
thyrsoidea 317, 318
undulata 317
variegata 317
zebra 316
Muraenichthys labialis 316
macropterus 313, 316
Muraenidae 315
muralis, Eleotris 361
murdjan, Myripristis 323
muricatus, Callyodon 360
mutabunda, Dules 330
Kuhlia 330
Myctophidae 319
Myctophum hians 313, 319
hyans 319
Myliobatidae 314
myriaster, Serranus 330
Myrichthys colubrinus 316
maculosus 316
Myriodon waigiensis 330
Myripristis adustus 323
argyromus 323
hexagonus 323
jacobus 323
lima 323
microphthalmus 323
multiradiatus 323
murdjan 323
praslinus 323
violaceus 323

N

naja, Ophichthys 316
narinari, Aetobatus 314
Stoasodon 314
taeniura 359
vanicolensis 359
vanicorensis 359
Naseus annulatus 346
brevirostris 346
lituratus 346
marginatus 346
olivaceus 346
thynnoides 346
tuberosus 346
unicornis 346
vlamingi 346
Naso annulatus 347
brevirostris 346
eoume 347
hexacanthus 347
lituratus 347
thynnoides 347
tuberosus 347
unicornis 346
nasus, Ostracion 366
nasuta, Raja 314
natans, Parapegasus 324
Naucrates ductor 326
nebulosa, Girella 335
Muraena 317
Saurida 319
Teuthis 347
nebulosus, Girellops 325
Halichoeres 355
Serranus 331
Valenciennea 361
Nedystoma dayi 318
nematacantha, Amia 328
Nematocentrus novae-guineae 324
nematoptera, Amia 327
nematopterus, Apogon 327
Nemipterus marginatus 335
nemurus, Pentapodus 335
Pentapus 335
neophytus, Gobius 362
Rhinogobius 362
Neosudis vorax 315
Neothunnus macropterus 325
Nesiotes 332
purpurescens 332
nesogallica, Scorpaena 348
Nesogobius 361
Nettostomops barbatula 317
Netuma thalassina 318
Neucrates indicus 326
nicobariensis, Holacanthus 344
niger, Plectorhinchus niger 334
nigra, Stigmatophora 313, 323
nigramaculatus, Antennarius 313
nigrans, Melanotaenia 324

PAGE
nigricans, Cypselurus 319
Hepatus 345
Pomacentrus 352
nigripinnis, Amia 328
Apogon 328
nigromaculatus, Antennarius 367
nigropinnatus, Cheilinus 358
nigropunctatus, Crayracion 367
Tetrodon 367
nigroris, Acanthurus 345
nigros, Acanthurus 344
nigrostriolatus, Microbuglossus 321
nigrum, Pristipoma 334
nigrus, Acanthurus 361
Plectorhinchus 334
Plesiops 331
niomatus, Pomacentrus 352
nitidus, Salarias 363
notacanthus, Clupea 315
notata, Genyoroge 333
notophthalmus, Pomacentrus 351
notopsis, Halichoeres 355
Platyglossus 355
notosticta, Teuthis 347
notostictus, Amphacanthus 347
Siganus 347
Novacula hoedtii 359
kallosoma 359
pavo 359
Novaculichthys taeniourus 359
novae-guineae, Amia 328
Apogon 328
Nematocentris 324
novae-hollandiae, Hippocampus 324
Sphyraena 313, 325
novae-zeelandiae, Brachypleura 320
novemfasciata, Amia 327
novemfasciatus, Apogon 327
nubila, Gymnothorax 318
Lycodontis 318
nuchipunctatus, Pseudoscarus 360
nummifer, Antennarius 367

O

oblongus, Carangoides 326
Caranx 326
Gastrophysus 367
Sphoeroides 367
obscura, Anguilla 315
obscurirostris, Gymnothorax 317
Euelatichthys 334
obtusirostris, Exocoetus 319
occidentalis, Ambassis 330
ocellatis, Chonophorus 362
Gobius 362
ocellata, Aboma 362
Gobius petrophilus var. 362
ocellatum, Chiloscyllium 314
ocellatus, Chaetodon 340
Gobius 362
Hemiscyllium 314
Parachaetodon 340
octolineata, Diacope 333
octovittatus, Chilodipterus 329
Odontanthias fuscipinnis 331
Odonus erythrodon 365
ogilbyi, Cypselurus 319
olfersi, Geophagus 350
oligosticta, Teuthis 347
olivaceus, Acanthurus 345
Naseus 346
onyx, Pomacentrus 351
oortii, Salarias 364
operculare, Holocentrum 322
opercularis, Holocentrus 322
Platyglossus 355
Ophichthus bonaparti 313, 316
cephalozona 316
Ophichthyidae 316
Ophichthys bicolor 316
bonapartii 316
cancrivorus 316
cephalozona 316
colubrinus 316
crocodilinus 316
filaria 316
maculosus 316
naja 316
Ophiocara aporos 360
hoedtii 360
macrolepidotus 360
ophiocephalus 360
porocephala 360
ophiocephalus, Eleotris 360
Ophiocara 360
Ophisurus alternans 316
alternanus 316
fasciatus 316
ophthalmotaenia, Gobius 363
orbicularis, Amia 327
Apogon 327
Platax 340
orbignyanus, Conger 313, 316
Orectolobidae 314
orientalis, Chanos 315
Dactyloptena 350
Dactylopterus 350
Grammistes 331
ornata, Ostracion (Aracana) 366
ornatissimus, Chaetodon 340
ornatus, Ostracion 366
Thysanocheilus 353
oro, Aspasmogaster 313, 364
Osphronemus trichopterus 330
Ostraciidae 366
Ostracion cornutus 366
cubicus 366
diaphanus 366
fornasini 366
lentiginosum 366
meleagris 366
nasus 366
(Aracana) ornata 366
ornatus 366
paschae 366
punctatus 366
whitleyi 313, 366
otaitensis, Pempheris 332
oualensis, Pempheris 332
ovalis, Chromis 351
Heliastes 351
ovatus, Trachinotus 327
Trachynotus 327
oviceps, Pseudoscarus 360
oxycephala, Eleotris 361
oxycephalus, Chaetodon 343
Cheilinus 358
Cirrhitichthys 339
Cirrhitus 339
Cypselurus 319
Upeneus 337
Oxyeleotris marmorata 360
Oxymonacanthus longirostris 366
oxyrhynchos, Cirrhitus 338
oxyrhynchus, Cheilinus 359
Cirrhitichthys 339
oyena, Gerres 336

P

pachycentron, Cephalopholis 330
Pagrosomus auratus 335
Pagrus unicolor 335
palasorrah, Scoliodon 314
pantherinus, Bothus (Platophrys) 320
Epinephelus 331
Platophrys 320
Rhomboidichthys 320
papilionaceus, Halichoeres 355
papuensis, Clupeoides 315
Gobiichthys 363
Paracanthistius 330
Parachaetodon ocellatus 340
Parachaeturichthys hinsbyi 361
Paracirrhites arcatus 339
cinctus 340
forsteri 337
melanotus 340
polystictus 339
Paragobiodon echinocephalus 361
Parapegasus natans 324
Parapercidae 363
Parapercis cylindrica 363
hexophthalma 363
Paraplagusia guttata 321
Paraplesiops bleekeri 332
Parascorpaena bandanensis 348
parasitus, Caranx 326
Pardachirus pavoninus 321
pardalis, Cantherines 366
Monacanthus 366
parvibranchialis, Lycodontis 317
parvipinnis, Carapus 364
Fierasfer 364
Jordanicus 364
paschae, Ostracion 366
pavo, Iniistius 359
Novacula 359
Pomacentrus 351
Rhomboidichthys 320
pavoninus, Achirus 321
Pardachirus 321
pectoralis, Gomphosus 357
Pegasidae 324
pelamis, Euthynnus 325
Pelates quadrilineatus 313, 334
sexlineatus 334
pelewensis, Chaetodon 342
Pelor didactylum 349
Pempheridae 332
Pempheris mangula 332
otaitensis 332
oualensis 332
vanicolensis 332
Pentapodus 335
aurolineatus 335
caninus 335
hellmuthii 335
nemurus 335
trivittatus 335
vitta 335
xanthopleura 313, 335
Pentapus 335
aurolineatus 335
hellmuthii 335
latifrons 332
nemurus 335
vitta 335
Percalates colonorum 330
Percis cylindrica 363
hexophthalma 363
tetracanthus 363
percula, Amphiprion 350
perdix, Apogonichthys 328, 329
perforata, Sardinella 315
perguttatus, Serranus 331
Periophthalmus argentilineatus 363
koelreuteri 363
koelreuterii 363
kölreuteri 363
periophthalmus, Salarias 364
permutatus, Heniochus 343
peronii, Caranx 326
Mugil 313, 324
persimilis, Aseraggodes 320
perspicillatus, Callyodon 359
perusii, Mugil 324
petelli, Gymnothorax 317
Lycodontis 317
Muraena 317
petrophilus, Bathygobius 361
Gobius 361
Petroscirtes anema 313, 363
atrodorsalis 363
elongatus 363
filamentosus 363
kallosoma 363
longifilis 363
mitratus 363
tapeinosoma 363

PAGE
phalaena, Amblygobius 362, 363
Gobius 362
phekadopleura, Stethojulis 354
Phtheirichthys lineatus 363
picta, Muraena 317
Plectorhynchus 334
pictus, Chaetodon 342
Chaunax 367
Gobius 361
Gymnothorax 317
Lycodontis 317
Plectorhinchus 334
Pimelepterus fuscus 335
tahmel 335
waigiensis 336
pinguis, Atherina 324
Hepsetia 324
pinnatus, Chaetodon 340
Platax 340
pinnulatus, Caranx 326
Cirrhitus 338
pisang, Caesio 334
Pisoodonophis cancrivorus 316
plagiometopon, Glyphidodon 353
Hemiglyphidodon 353
Plagusia guttata 321
Platacidae 340
Platax orbicularis 340
pinnatus 340
teira 340
Platophrys mancus 320
pantherinus 320
smithi 320
(Arnoglossus) tapeinosoma 320
Platycephalidae 350
Platycephalus crocodilus 350
japonicus 350
punctatus 350
variolosus 350
binotopsis 335
Platyglossus chloropterus 355
geoffroyi 355
geoffroyii 355
guttatus 355
hoeveni 355
hortulanus 354
marginatus 355
melanurus 355
miniatus 355
notopsis 355
opercularis 355
poecilus 355
trimaculatus 354
platyrhynchus, Endeconger 316
platyura, Belone 319
plebeius, Polydactylus 325
Polynemus 325
plebejus, Polynemus 325
Plectropomus 330
maculatus 330
Plectorhinchus affine 334
diagramma 334
niger 334
nigrus 334
pictus 334
punctatus 334
schotaf 334
Plectorhynchus picta 334
Plesiops nigricans var. apoda 332
caeruleo-lineatus 332
corallicola 332
melas 313, 331
nigricans 331
Pleuronectidae 320
pleurostigma, Upeneus 337
pleurotaenia, Doryichthys 323
Mullus 337
plicatilis, Cestraeus 325
plikatile, Agonostoma 325
Plotosidae 318
Plotosus anguillaris 318
caninus 318
Poecilophis polyzonus 316

PAGE
poecilurus, Bothus (Arnoglossus) 320
Scaeops 320
poecilus, Platyglossus 355
polyacanthus, Dascyllus 351
Polydactylus plebeius 325
sexfilis 325
polylepis, Sebastes 349
polymnus, Amphiprion 350
Polynemidae 325
Polynemus plebeius 325
plebejus 325
taeniatus 325
polystictus, Paracirrhites 339
polyuranodon, Lycodontis 317
Muraena 317
polyzona, Echidna 316
Muraena 316
Pomacentridae 350
Pomacentrus bifasciatus 352
cyanospilus 351
inornatus 352
lividus 351
melanopterus 351
melanotus 351
nigricans 352
niomatus 352
notophthalmus 351
onyx 351
pavo 351
scolopsis 352
tripunctatus 351
vanicolensis 351
Pomadasyidae 334
pondicerianum, Rachycentron 327
porocephala, Ophiocara 360
porocephaloides, Eleotris 360
poropterus, Achirus 320
porosus, Upeneichthys 336
porphyreus, Upeneus 336
potteri, Holacanthus 344
praslinus, Myripristis 323
Premnas biaculeatus 350
Priacanthidae 332
Priacanthus boops 332
carolinus 332
cruentatus 332
hamrur 332
macracanthus 332
Pristipoma nigrum 334
Pristipomoides microdon 332
microlepis 332
sieboldii 332
Promicrops lanceolatus 331
Psammoperca waigiensis 330
Psettus argenteus 340
Pseudocheilinus hexataenia 358
psittacula 358
Pseudochromis 332
fuscus 332
purpurescens 332
Pseudolabrus inscriptus 357
pseudominiatus, Halichoeres 355
Pseudoplesiopidae 332
Pseudoplesiops typus 332
Pseudorhombus arsius 320
multimaculatus 313, 320
Pseudoscarus aeruginosus 360
bataviensis 360
cyanognathus 360
dimidiatus 360
erythrodon 359
ghobban 360
globiceps 360
gymnognathus 359
harid 360
humbavensis 359
janthochir 360
microrhinus 360
nuchipunctatus 360
oviceps 360
quoyi 360
rubroviolaceus 360
singaporensis 360
spilonothus 360

PAGE
spinus 360
sumbavensis 359
Pseudupeneus chrysonemus 337
indicus 337
moana 336
psittacula, Pseudocheilinus 358
Pterois antennata 349
brachyptera 349
cincta 349
radiata 349
volitans 349
zebra 349
puellus, Siganus 348
pulcher, Anampses 354
puntangoides, Gobius 361
punctata, Clupea 315
Harengula 315
punctatissimum, Holocentrum 321
punctatissimus, Holocentrus 321
punctato-fasciatus, Chaetodon 342
punctatus, Cirrhites 338
Drepane 340
Gerres 336
Ostracion 366
Platycephalus 350
Plectorhinchus 334
Siganus 347
punctiformis, Tetragonopterus 342
punctularum, Gobiosoma 363
purpurascens, Seriola 325
purpurescens, Nesiotes 332
Pseudochromis 332
purpureum, Thalassoma 356
pusillus, Bascanichthys 316
puta, Terapon 334

Q

quadricolor, Julis 356
quadricornis, Salarias 364
quadrifasciata, Amia 313, 328
Apogon 328
quadrifasciatus, Apogon 328
quadrilineatus, Holocentrus 334
Pelates 313, 334
quadrimaculatus, Chaetodon 342
quaesita, Rhinomuraena 317
quernus, Serranus 331
quinquelineatus, Cheilodipterus 329
Chilodipterus 329
quinque-strigatus, Gobiodon 361
quinquevittatus, Thalassoma 356
quoyi, Callyodon 360
Pseudoscarus 360

R

Rachycentridae 327
Rachycentron canadum 313, 327
pondicerianum 327
nasuta 314
radiata, Pterois 349
radiatus, Cheilinus 358
raffelsi, Chaetodon 342
rafflesii, Chaetodon 342
Raja asperrima 314
Rastrelliger brachysoma 325
rectangulus, Balistes 365
reevesi, Gymnothorax 318
Muraena 318
reevesii, Lycodontis 318
Thyrsoidea 318
remora, Echeneis 363
reticularis, Muraena 317
reticulata, Ambassis 313, 329
interrupta var. 329
reticulatus, Chaetodon 342
Gymnothorax 317
Rhabdamia 329
clupeiformis 329
rhinechidna, Enchelynassa 318
Rhinobatidae 314
Rhinobatos granulatus 314
Rhinobatus granulatus 314
Rhinogobius laddi 313, 362

PAGE
multifasciatus 362
neophytus 362
Rhinomuraena eritomia 317
quaesita 317
rhodoptera, Amia 327
rhodopterus, Amia 327
rhombeum, Zebrasoma 346
rhombeus, Acanthurus 346
Gerres 336
multimaculatus 320
Rhomboidichthys pantherina 320
pantherinus 320
pavo 320
Rhombosoma goldiei 324
richardsoni, Gymnothorax 318
Muraena 318
richardsonii, Lycodontis 318
ringens, Balistes 365
rivulatus, Cheilinus 358
Gobiodon 361
Siganus 347
rostrata, Teuthis 347
rostratus, Siganus 347
ruber, Holocentrus 321
rubescens, Cypselurus 319
rubroviolaceus, Pseudoscarus 360
rubrum, Holocentrum 321
rupestris, Dules 330
Kuhlia 330
ruppelli, Lycodontis 317
rüppellii, Monacanthus pardalis var. 366

S

sadanundio, Gobius 361
safgha, Ambassis 329
Sciaena 329
Salarias arenatus 363
brevis 363
edentulus 364
fasciatus 363
fuscus 363
gibbifrons 364
griseus 364
guttatus 364
hasselti 364
hasseltii 313, 364
holomelas 363
lineatus 364
marmoratus 363
meleagris 364
nitidus 363
oortii 364
periophthalmus 364
quadricornis 364
striatomaculatus 313, 364
salmoides, Serranus 331
salmoneus, Chanos 315
sammara, Holocentrum 322
samoensis, Mulloides 337
Mulloidichthys 337
sanctae-helenae, Caranx 326
Decapterus 326
sancti petri, Chorinemus 325
Scomberoides 325
sandei, Amia 327
Apogon 327
sandvicensis, Dules 330
sangiensis, Amia 328
Apogon 328
Sardinella jussieu 315
melanura 315
perforata 315
Saurida gracilis 319
nebulosa 319
tumbil 319
Saurus varius 318
savayensis, Apogon 327
saxatilis, Abudefduf 352
scaber, Tetrodon 367
scabra, Scorpaenodes 349
Scaeops poecilurus 320
spilura 320
scapularis, Halichoeres 354

PAGE
Scarichthys auritus 359
caeruleopunctatus 359
Scarus balinensis 360
galena 360
maculosus 360
microcheilos 360
striatus 360
Scatophagidae 340
Scatophagus argus 340
tetracanthus 340
Schedophilus maculatus 325
marmoratus 325
schlegelii, Erythrocles 336
schotaf, Plectorhinchus 334
Sciaena safgha 329
Scoliodon dumerilii 313, 314
palasorrah 314
Scolopsis bilineatus 334
cancellata 334
cancellatus 334
ciliata 334
ciliatus 334
ghanam 334
monogramma 334
temporalis 334
trilineatus 334
triliniatus 334
scolopsis, Pomacentrus 352
Scomber auratus 335
djeddaba 326
japonicus 325, 335
kanagurta 325
microlepidotus 325
Scomberoides sancti-petri 325
toloo 325
toloo parah 325
Scombridae 325
scopas, Acanthurus 346
Amanses 366
Scorpaena alba brunnea 348
cirrhosa 348
cruenta 348
diabolus 348
gibbosa 348
guamensis 349
haplodactylus 348
militaris 348
nesogallica 348
Scorpaenidae 348
Scorpaenodes guamensis 349
scabra 349
Scorpaenopsis cirrhosus 348
gibbosus 348
scripta, Alutera 366
Scuticaria unicolor 318
Scyris indica 327
sebae, Amphiprion 350
Ostracion 366
Serranus 331
Sebastapistes albobrunneus 348
asperella 348
bynoensis 349
galactacma 348
zanzibarensis 349
Sebastes polylepis 349
seheli, Mugil 324
Selar boops 326
crumenophthalmus 326
torvus 326
selene, Chaetodon 342
Tetragonopterus 342
Semachlorella 359
semeion, Chaetodon 341
semicinctus, Amblygobius 363
Gobius 363
Leiuranus 316
Mesoprion 333
semicirculatus, Holacanthus 344
semidecorata, Julis 355
semidiscus, Hologymnosus 356
semidoliatus, Gobius 363
Zonogobius 363
semipunctatus, Asterropterix 361
Eleotris (Asterropteryx) 361
semistriatus, Leptonotus 324

PAGE
Syngnathus 313, 324
sephen, Dasyatis 314
Trygon 314
septemfasciatus, Abudefduf 352
Glyphidodon 352
Glyphisodon 352
7-fasciatus, Glyphidodon 352
Seriola dumerilii 325
purpurascens 325
Seriolichthys bipinnulatus 326
Serranidae 330
Serranus altivelioides 331
caeruleo-punctatus 331
corallicola 331
crapao 331
fasciatus 331
faveatus 331
fuscoguttatus 331
guttatus 331
hexagonatus 331
var. colonus 313
hoevenii 331
lanceolatus 331
leopardus 331
louti 330
maculatus 331
malabaricus 313, 331
merra 331
myriaster 330
nebulosus 331
perguttatus 331
quernus 331
salmonoides 331
sebae 331
socialis 331
suillus 331
summana 331, 351
tauvina 351
trimaculatus 331
ura 331
urodelus 331
serrata, Fistularia 324
serratus, Gasterosteus 324
servus, Therapon 334
setifer, Chaetodon 342
sexfasciatus, Abudefduf 352
Caranx 326
sexfilis, Polydactylus 325
sexlineatus, Grammistes 331
Pelates 334
sibi, Germo 325
Sicydium lagocephalum 361
taeniurum 361
Sicyopterus taeniurus 361
sidat, Anguilla 315
sieboldii, Pristipomoides 332
Siganidae 347
Siganus albopunctatus 347
argenteus 347
canaliculatus 347
concatenatus 347
doliatus 347
fuscescens 347
lineatus 347
notostictus 347
puellus 348
punctatus 347
rivulatus 347
rostratus 347
spinus 347
stellatus 347
vermiculatus 347
vulpinus 348
sihama, Sillago 337
Sillaginidae 337
Sillago sihama 337
simus, Cypselurus 319
sinensis, Bostrichthys 360
Eleotris 360
singaporensis, Pseudoscarus 360
singapurensis, Cheilodipterus 329
Siphamia argyrogaster 329
Smaris gracilis 335
smithi, Platophrys 320
socialis, Epinephelus 331

PAGE
Serranus 331
solandri, Acanthocybium 325
Tetrodon 366
Solea heterochira 321
heterochisma 321
heterorhina 321
Soleichthys heterorhinos 321
Soleidae 320
soporator, Gobius 361
sordidus, Abudefduf 352
Glyphisodon 352
Sparidae 335
Sparus bandatus 358
speciosus, Caranx 326
Gnathanodon 326
Sphaerodon euanus 335
grandoculis 335
Sphagebranchus longipinnis 316
sphenospilus, Chaetodon 342
Sphoeroides hamiltoni 367
hypselogenion 367
oblongus 367
Sphyraena barracuda 325
commersonii 325
forsteri 325
novae-hollandiae 313, 325
Sphyraenidae 325
Sphyrna zygaena 314
Sphyrnidae 314
spilonothus, Pseudoscarus 360
spilonotopterus, Cypselurus 319
spilosoma, Monacanthus 366
spilura, Scaeops 320
spinidens, Callyodon 359
spinifer, Holocentrus 322
spiniferum, Holocentrum 322
spinus, Callyodon 360
Pseudoscarus 360
Siganus 347
Spratella fimbriata 315
Spratelloides alburnus 315
delicatulus 315
gracilis 315
Squalidae 314
Squalus suckleyi 314
steindachneri, Antigonia 340
stellans, Epinephelus 331
stellata, Teuthis 348
stellatus, Siganus 347
Tetrodon 367
Stethojulis albovittata 354
axillaris 354
casturi 354
phekadopleura 354
strigiventer 354
stevensi, Apogon fasciata 327
fasciatus 327
Stigmatophora nigra 313, 323
Stoasodon narinari 314
Stolephorus alburnus 315
delicatulus 315
japonicus 315
striatomaculatus, Salarias 313, 364
striatus, Acanthurus 345
Ctenochaetus 344
Scarus 360
strigangulus, Chaetodon 343
Megaprotodon 343
strigata, Amphisile 324
Eleotris 361
strigatus, Centriscus 324
Microcanthus 343
Valenciennea 361
strigiventer, Stethojulis 354
strigosus, Acanthurus 344
Ctenochaetus 344
striolata, Teuthis 347
striolatus, Canthogaster papua var. 367
Tetrodon papua var. 367
Strongylura crocodila 319
incisa 319
indica 319
tahitiensis 319
urvillii 319
Strophiodon brummeri 317
suckleyi, Squalus 314
suillus, Serranus 331
sumbavensis, Pseudoscarus 359
summana, Serranus 331, 351
surinamensis, Lobotes 332
Symbranchus bengalensis 315
Symphurus guttatus 321
vittatus 321
Synanceia brachio 349
verrucosa 349
Synanceja verrucosa 349
Synaptura aspilos 321
mülleri 321
villosa 321
Synbranchidae 315
Synbranchus bengalensis 315
Syngnathidae 323
Syngnathoides biaculeatus 323
Syngnathus conspicillatus 324
margaritifer 313, 323
semistriatus 313, 324
Synodontidae 318
Synodus japonicus 318

T

tabaccaria, Fistularia 324
Tachysuridae 318
Tachysurus armiger 318
tade, Mugil 324
taenia, Leptocephalus 316
Taenianotus triacanthus 349
triacantus 349
taeniatus, Polynemus 325
theraps 334
unicolor 334
taenioptera, Amia 328
taeniopterus, Apogon 328
taeniourus, Novaculichthys 359
taeniura, Novacula 359
Taeniura atra 314
lymma 314
taeniurum, Sicydium 361
taeniurus, Dules 330
Sicyopterus 361
tahiticum, Holocentrum 322
tahitiensis, Strongylura 319
tahmel, Pimelepterus 335
tapeinosoma, Arnoglossus 320
Petroscirtes 363
Platophrys (Arnoglossus) 320
taupou, Abudefduf 352
tauvina, Serranus 351
teira, Platax 340
tembang, Clupea 315
temporalis, Scolopsis 334
Terapon argenteus 334
jarbua 334
puta 334
triostegus 346
vermiculatus 347
Teraponidae 334
ternatensis, Chromis 351
tessellata, Gymnothorax 318
Muraena 318
testudinarius, Arothron 367
tetracanthus, Percis 363
Scatophagus 340
Tetragonopterus meieri 340
punctiformis 342
selene 342
triangulus 343
tetragonus, Monacanthus 366
Tetraodon hispidus 367
Tetrapturus mitsukurii 325
Tetraroge vestitus 349
Tetrodon albopunctatus 367
bennettii 366
hamiltonii 367
hispidus 367
hypselogenion 367
(Arothron) immaculatus 367
insularum 367
janthinopterus 367
hispidus var. laterna 367
mappa 367
margaritatus 366
(Ansomius) margaritatus 367
meleagris 367
nigropunctatus 367
scaber 367
solandri 366
stellatus 367
papua var. striolatus 367
valentini 366
virgatus 367
(Arothron) immaculatus var. virgatus 367
Tetrodontidae 367
Teuthis albopunctata 347
argentea 347
concatenata 347
doliata 347
elongatus 344
hexagonatus 347
lineatus 345
marmorata 347
nebulosa 347
notosticta 347
oligosticta 347
rostrata 347
stellata 347
striolata 347
thalassina, Netuma 318
thalassinus, Arius 318
Thalassoma amblycephalus 357
ballieui 357
duperrey 357
hardwicke 356
jansenii 356
lunare 356
lutescens 357
melanochir 357
purpureum 356
quinquevittatus 356
trilobata 356
umbrostygma 356
thepassi, Achirus 320
Therapon argenteus 334
cinereus 334
cuvieri 334
cuvierii 334
servus 334
trivittatus 334
unicolor 334
theraps, Terapon 334
Theutis stellatus, Amphacanthus 347
Thunnus thynnus 325
thynnoides, Naseus 346
Naso 347
thynnus, Thunnus 325
Thyrsoidea arenata 317
cancellata 317
reevesii 318
thyrsoidea, Gymnothorax 317, 318
Lycodontis 317
Muraena 317, 318
Thysanocheilus ornatus 353
Thysanophrys crocodilus 350
japonicus 350
variolosus 350
tiereoides, Holocentrum 321
Holocentrus 321
tigrina, Gymnomuraena 318
tigrinus, Galeocerdo 314
Ichthyophis 318
Uropterygius 318
tile, Caesio 334
toloo, Chorinemus 325
Scomberoides 325
toloo parah, Scomberoides 325
tomentosus, Monacanthus 366
torvus, Selar 326
Toxotes jaculator 340
Toxotidae 340
Trachinotus falcatus 327
ovatus 327
Trachurus trachurus 326
trachurus, Trachurus 326
Trachynotus ovatus 327

PAGE
Trachypoma macracanthus 330
triacanthus, Taenianotus 349
triacantus, Taenianotus 349
triangulum, Chaetodon 343
triangulus, Tetragonopterus 342
trichopterus, Osphronemus 330
tricolor, Amphiprion 350
Gomphosus 358
trifascialis, Chaetodon 343
trifasciata, Amia 327
trifasciatus, Apogon 327
Chaetodon 340
Glyphidodon 352
Mullus 336
Upeneus 313
Trigla cuculus 350
kumu 350
trilineatus, Scolopsis 334
triliniatus, Scolopsis 334
trilobata, Julis 356
Thalassoma 356
trilobatus, Cheilinus 358
Julis 356
trimaculata, Amia 327
Güntheria 354
trimaculatus, Apogon 327
Dascyllus 350
Halichoeres 354
Holacanthus 344
Platyglossus 354
Serranus 331
triostegus, Acanthurus 345
Hepatus 345, 346
Teuthis 346
Tripterygium hemimelas 363
trivittatus, Pentapodus 335
Therapon 334
troscheli, Mugil 324
Trygon granulata 314
kuhlii 314
sephen 314
tuberosus, Naseus 346
Naso 347
tubulata, Amia 328
tubulatus, Apogon 328
tumbil, Saurida 319
Tylosurus urvillii 319
typus, Achirophichthys 313, 316
Carangichthys 313, 326
Pseudoplesiops 332

U

umbrostigma, Julis 356
umbrostygma, Julis 356
Thalassoma 356
undulata, Muraena 317
undulatus, Balistapus 365
Balistes 365
Cheilinus 358
Muraena 317
unicellatus, Glyphidodon 353
unicolor, Cypsilurus 319
Pagrus 335
Scuticaria 318
Terapon 334
Therapon 334
unicornis, Naseus 346
Naso 346
unifasciatus, Cheilinus 358
Glyphidodon 352
unimaculatus, Abudefduf 352
Chaetodon 342
uniocellatus, Abudefduf 353
Glyphidodon 353
Glyphisodon 353
unipinna, Caracanthus 350
(Amphiprionichthys) 350
Micropus 350
Upeneichthys porosus 336
Upeneoides arge 336
vittatus 336

PAGE
Upeneus atrocingulatus 337
barberinus 337
barberoides 336
bifasciatus 336
chryserydros 337
chryserythrus 337
chrysonemus 313, 337
cyclostoma 337
fraterculus 337
indicus 337
luteus 337
macronemus 337
malabaricus 337
moana 336
multifasciatus 336
oxycephalus 337
pleurostigma 337
porphyreus 336
taeniatus 337
trifasciatus 313, 336
ura, Serranus 331
uramensis, Apogon 328
urodelus, Cephalopholis 331
Serranus 331
Urogymnus asperrimus 313, 314
Uropterygius concolor 318
marmoratus 318
tigrinus 318
urotaenia, Ambassis 329
urvillii, Strongylura 319
Tylosurus 319

V

vagabundus, Chaetodon 342
vaigiensis, Centrogenys 330
Kyphosus 336
Liza 324
Mugil 324
Valenciennea longipinnis 361
muralis 361
strigatus 361
Valenciennia 361
valentini, Canthigaster 366
Tetrodon 366
vanicolaris, Mulloides 337
vanicolensis, Hypseleotris 361
Mulloides 337
Mulloidichthys 337
Novacula 359
Pempheris 332
Pomacentrus 351
vanicorensis, Novacula 359
variegata, Echidna 317
Muraena 317
Variola louti 330
variolosus, Cirripectes 363
Platycephalus 350
Salarias 363
Thysanophrys 350
varius, Gomphosus 357
Heniochus 343
Saurus 318
velifer, Acanthurus 346
veliferum, Zebrasoma 346
velox, Chromis 351
venenosa, Clupea 315
venusta, Coris 355
verater, Chromis 351
vermiculatus, Siganus 347
Teuthis 347
verrens, Veternio 316
verrucosa, Synanceia 349
Synanceja 349
verrucosus, Balistapus 365
versicolor, Amia 329
verticalis, Gobiodon 361
vestitus, Gymnapistus 349
Tetraroge 349
Veternio verrens 316
vidua, Balistes 364
villosa, Synaptura 321

PAGE
villosus, Brachirus 321
violaceum, Holocentrum 322
violaceus, Holocentrus 322
Myripristis 323
violescens, Bowersia 332
virescens, Anguilla 315
Aprion 332
virgatus, Tetrodon 367
(Arothron) immaculatus var. 367
viridis, Boleophthalmus 363
vitta, Pentapodus 335
Pentapus 335
vittata, Harengula 315
vittatus, Chaetodon 340
Cheilodactylus 337
Symphurus 321
Upeneoides 336
vlamingi, Naseus 346
volitans, Exocoetus 319
Pterois 349
vorax, Chirocentrus dorab 315
Neosudis 315
vrolikii, Holacanthus 344
vulgaris, Acanthias 314
vulpes, Albula 315
vulpinus, Siganus 348

W

waigiensis, Glyphidodon 351
coelestinus var. 352
Myriodon 330
Pimelepterus 336
Psammoperca 330
waikiki, Mionorus 329
Wetmorella 358
philippina 358
whitleyi, Drombus 313, 362
Ostracion 313, 366
wichmanni, Amia 327
Apogon 327

X

xantherythrus, Holocentrus 322
xanthopleura, Gymnothorax 318
Heterognathodon 335
Pentapodus 313, 335
xanthosoma, Dascyllus 351
xanthozona, Abudefduf 353
Glyphidodon 353
Xiphias gladius 325
Xiphiidae 325

Z

Zanclidae 344
Zanclus canescens 344
cornutus 344
zanzibarensis, Sebastapistes 349
zebra, Dendrochirus 349
Echidna 316
Muraena 316
Zebrasoma agana 346
flavescens 346
rhombeum 346
veliferum 346
Zenarchopterus dispar 319
kampeni 319
zeunasi, Clupea 315
zonarcha, Scaridea 359
zonatus, Abudefduf 353
Apsilus 332
Glyphisodon 353
zonipectus, Gymnothorax 318
Zonogobius semidoliatus 363
Zoramia graeffii 328
zosterophora, Archamia 329
zosterophorus, Apogon 329
zunasi, Clupea 315
Zygaena malleus 314
zygaena, Sphyrna 314

THE FISHES OF OCEANIA—SUPPLEMENT 2

By Henry W. Fowler

Memoirs of the Bernice P. Bishop Museum
Volume XI, Number 6

(WITH FIGURES 1-4)

HONOLULU, HAWAII
PUBLISHED BY THE MUSEUM
1934

KRAUS REPRINT CO.
Millwood, New York
1974

Reprinted with the permission of the Bishop Museum Press
KRAUS REPRINT CO.
A U.S. Division of Kraus-Thomson Organization Limited

Printed in U.S.A.

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By Henry W. Fowler

INTRODUCTION

This supplement includes chiefly distributional references that have appeared in ichthyological papers since the publication of my "Fishes of Oceania" and "Supplement 1." The titles of these papers are included in the Bibliography (p. 451).

I am fortunate to have received through the kindness of Mr. Gilbert P. Whitley of the Australian Museum a catalog of more than a thousand determinations of the fishes in that institution from islands in Oceania. Mr. Whitley has not only supplied me with the data available to him, but has also called my attention to a number of neglected or overlooked items, very generously placing this matter at my disposal. All such details are duly credited with his name. In addition, notes and descriptive material resulting from the study of a few collections sent to me from Bernice P. Bishop Museum are given. No new names are proposed.

Of special interest is the large number of species which have come to light since the publication of my "Fishes of Oceania" and "Supplement 1." These are shown in the text by an asterisk.

Geographic names are printed as they appear in the sources cited, though many are old forms out of accord with current official usage, as, for example, Suwarow [Suvarov], Mariannes [Marianas], Nuka Hiva, Marquesas [Nukuhiva], Santa Cruz Group [Santa Cruz Islands], Tongataboo [Tongatabu].

DESCRIPTION OF SPECIES

ORECTOLOBIDAE

Hemiscyllium ocellatum (Bonnaterre).

Port Moresby, New Guinea (Whitley). Although Mr. Whitley mentions *Stegostoma tygrinum* (Bonnaterre) as in the Australian Museum from the Aru Islands, these are not properly within the limits of Oceania as I have arbitrarily defined them.

Orectolobus ornatus (De Vis).*

Crossorhinus ornatus De Vis: Linn. Soc. New South Wales, Proc., ser. 2, vol. 7, p. 289, 1883 (type loc., Moreton Bay, Queensland).

Crossorhinus barbatus (not Gmelin) Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 597, 1882 (New Guinea).

Port Moresby, New Guinea (Whitley), on Macleay's material.

Ogilby founded his *Orectolobus devisi* on De Vis, assuming the latter's *Crossorhinus ornatus* preoccupied by *Scyllium ornatum* Gray 1832. The mere arrangement of Gray's *Scyllium ornatum* in *Orectolobus* by Bonaparte in 1834 does not invalidate De Vis, hence *Orectolobus devisi* Ogilby falls as a synonym of the present species.

Orectolobus dasypogon (Bleeker).

Male 1,143 mm long from Samarai, British New Guinea (Whitley).

In "Fishes of Oceania" this species is placed in *Eucrossorhinus,* though as Garman has better suggested "Probably a subgenus of *Orectolobus.*"

Ginglymostoma ferrugineum (Lesson).

One 685 mm long from Port Moresby, New Guinea, in the Australian Museum, Macleay's material. Also one from Florida Island, Solomons (Whitley).

GALEORHINIDAE

Galeocerdo arcticus (Faber).

Female foetus from Ugi, Solomons, in the Australian Museum, the basis of Ogilby's record (Whitley).

Eulamia sorrah (Müller and Henle).

Eulamia sorrah Fowler: U. S. Nat. Mus., Proc., vol. 81, art. 8, p. 1, 1932 (Niuafoou Island).

Carcharias marianensis Engelhardt, Zool. Anz., vol. 39, p. 647, 1912 (type loc., Guam, Mariannes).

Snout strongly rounded as seen from above. Nasal lobes more obtuse than *Carcharias sorrah*. Spiracle absent. Dorsals above and ventrals posteriorly angular or pointed (obtuse in *C. sorrah*). Anal edge little concave (deep angle in *C. sorrah*). Pectoral very large, long as head (shorter in *C. sorrah*). Dorsal tip black (without black tip in *C. sorrah*). Back uniform brown. Length 400 mm. (Engelhardt.)

I feel it quite likely that Engelhardt's nominal *Carcharias marianensis* is a synonym of the present species.

Eulamia melanopterus (Quoy and Gaimard).

Carcharias melanopterus Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 2, Jan.-Mar. 1932 (Tahiti).

One from Ugi, Solomons, in the Australian Museum. Other material from Viatupu, Ellice Islands (Whitley).

Eulamia menisorrah (Müller and Henle).

Port Moresby, New Guinea, on Ogilby's material (Whitley).

Scoliodon dumerilii (Bleeker).

New Hebrides, reported by Ogilby (Whitley).

SPHYRNIDAE

Sphyrna zygaena (Linnaeus).

One in the Australian Museum from Hawaii (Whitley).

ECHINORHINIDAE

Isistius brasiliensis (Quoy and Gaimard).

Isistius brasiliensis Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 84, 1931 (lat. 0° 0′ N., long. 146° 5′ E.).

Echinorhinus cookei Pietschmann.*

Echinorhinus cookei Pietschmann: B. P. Bishop Mus., Bull. 73, p. 3, fig. 1, pl. 1, *a-b*, 1930 (type loc., south coast of Kauai).

RHINOBATIDAE

Rhinobatos granulatus Cuvier.

Port Moresby, New Guinea, on Macleay's material (Whitley).

Rhinobatos thouinianus (Shaw).

Fife Bay, Hood Bay, New Guinea, on Macleay's material (Whitley).

DASYATIDAE

Urogymnus asperrimus (Schneider).

Gilbert Islands, piece of skin in Australian Museum (Whitley).

Dasyatis sephen (Forskål).

Trygon sephen Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 84, 1931 (Seeadler Harbor, Admiralty Islands).

Taeniura atra Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 598, 1882 (type loc., New Guinea).

Type of *Taeniura atra* Macleay in the Australian Museum, 890 mm long, from Port Moresby (Whitley). *Taeniura atra* as given in "Fishes of Oceania" should therefore be suppressed.

Dasyatis kuhlii (Müller and Henle).

Port Moresby, New Guinea. Also one from Ugi, Solomons (Whitley).

Dasyatis granulatus (Macleay).

Himantura granulata Whitley: Australian Mus., Rec., vol. 16, no. 4, p. 211, figs. 1-2, Mar. 28, 1928 (type of *Trygon granulata*; reef off Sunday Island, Vanikoro).

Type of *Trygon granulata*, no. 1, 9763 A.M. Port Moresby district, New Guinea. Andrew Goldie. Also Vanikoro specimen no. 1 A. 2867 (Whitley).

Gymnura poecilura (Shaw).

Pteroplatea poecilura as given in "Fishes of Oceania" will give place to the above name. *Gymnura* Van Hasselt 1823 has precedence over *Pteroplatea* Müller and Henle 1837, with the genotype *Raja micrura* Schneider. The Pacific species will then stand: *Gymnura japonica* (Schlegel); *Gymnura crebripunctata* (Peters); *Gymnura micrura* (Schneider); *Gymnura marmorata* (Cooper); *Gymnura bimaculata* (Norman).

MYLIOBATIDAE

Aetobatus narinari (Euphrasen).

Aetobatus narinari Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 1, p. 4, Oct.-Dec. 1931 (Tenibuli, Ysabel Island, Solomons); vol. 7, no. 1, p. 2, Jan.-Mar. 1932 (Tahiti).

MOBULIDAE

Manta birostris (Walbaum).

Manta birostris Fowler: U. S. Nat. Mus., Proc., vol. 80, art. 6, p. 2, 1931 (Ua Huka Island; Obi Tufa Bay, Eire Island; Shavy Bay, Ua Huka, Marquesas).

Manta alfredi Stead.*

Manta alfredi Stead: Fishes of Australia, p. 233, 1906 (type loc., Port Jackson).

Ceratoptera alfredi Waterhouse, Roviana and English Dictionary, p. 168, 1928 (Roviana, Solomons).

Desmomanta alfredi Whitley: Australian Mus., Rec., vol. 18, no. 6, p. 328, pl. 37, figs. 1-4, Apr. 20, 1932 (holotype).

Although Mr. Whitley separates this species in a genus supposed to be distinct from *Manta*, my studies of adult *M. birostris* lead me to different conclusions. His statement, "Similar to *Manta* Bancroft as described by Jordan and Evermann, but with cephalic horns farther apart and posterior margins of pectoral fins less concave," is far from convincing. The figure these authors, as well as Gill, use is notoriously inaccurate and surely can not be relied on for any comparisons.

ELOPIDAE

Elops machnata (Forskål).

Argentina machnata Forskål: Descr. animalium, pp. XIII, 68, 1775 (type loc., Djedda, Red Sea).

Elops saurus (not Linnaeus) Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 69, 1932 (Noumea, New Caledonia).

This species given as *Elops hawaiensis* Regan in "Fishes of Oceania" and "Supplement 1."

Megalops cyprinoides (Broussonet).

Megalops cyprinoides Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 11, Oct.-Dec. 1931 (New Hebrides); vol. 7, no. 1, p. 2, Jan.-Mar. 1932 (Tahiti).

Port Moresby, New Guinea, Macleay's material (Whitley).

ALBULIDAE

Albula vulpes (Linnaeus).

Albula vulpes Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 11, Oct.-Dec. 1931 (New Hebrides).

Albula conorynchus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 70, 1932 (Borabora, Society Islands).

One from Malekula, New Hebrides; one from Hawaii; Hood Bay, New Guinea; Vaitupu, Ellice Islands, by D. G. Kennedy (Whitley).

CHANIDAE

Chanos chanos (Forskål).

Chanos chanos Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 11, Oct.-Dec. 1931 (New Hebrides).

Chanos salmoneus Duncker and Mohr: Naturh. Mus.

Hamburg, Mitteil., vol. 44, p. 83, 1931 (north coast of Admiralty Islands).

Australian Museum specimens from Fiji, Pleasant Island (introduced); Hawaii; Vaitupu, Ellice Islands, as "Panavea" (mullet, milk fish) (Whitley).

CLUPEIDAE

Stolephorus delicatulus (Bennett).

Spratelloides delicatulus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil, vol. 44, p. 83, 1931 (St. Matthias, Ekaliu; Rein Bay, north coast New Pomerania).

Stolephorus delicatulus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 4, Oct.-Dec. 1931 (Haethorn Sound; Tulagi; Shortland Islands); p. 11 (New Hebrides); vol. 8, no. 4, p. 12, Oct.-Dec. 1933 (Madang, New Guinea).

In Australian Museum examples from Roviana, British Solomons; Vila, New Hebrides; Ontong Java (Whitley).

Stolephorus japonicus (Houttuyn).

Stolephorus japonicus Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 30, Jan.-Mar. 1932 (Tahiti).

Dussumieria acuta Valenciennes.

Hood Bay, New Guinea (Whitley).

Sardinella jussieu (Lacépède).

Clupea (Harengula) fimbriata Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 83, 1931 (St. Matthias, Ekaliu).

Sardinella melanura (Cuvier).

Clupea melanura Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 83, 1931 (Hansa Bay, New Guinea).

Harengula melanura Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 11, Oct.-Dec. 1931 (New Hebrides).

Sardinella sirm (Walbaum).

Samoa (Whitley).

Sardinella sindensis (Day).*

Clupea sindensis Day, Fishes of India, pt. 4, p. 638, pl. 163, fig. 2, 1878 (type loc., Kurrachee). Borodin: Vanderbilt Mus., Bull., vol. 1, art. 3, p. 70, 1932 (Noumea, New Caledonia, Coral Sea).

Harengula punctata (Rüppell).

Harengula punctata Fowler: U. S. Nat. Mus., Proc., vol. 80, art. 6, p. 2, 1932 (Taiohae); B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 3, Feb. 1932 (Apia: remarks).

Harengula moluccensis Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 11, Oct.-Dec. 1931 (New Hebrides).

In the Australian Museum examples from Roviana, British Solomons; Peu, Vanikoro; Giza, Solomons (Whitley).

Clupeoides papuensis (Ramsay and Ogilby).

Types of *Corica papuensis* from the Strickland River, New Guinea, 50 to 78 mm (Whitley).

DOROSOMIDAE

Clupanodon thrissa (Linnaeus).

Hood Lagoon and Strickland River, New Guinea, as *Chatoessus nasus* (Whitley).

Anodontostoma chacunda (Buchanan-Hamilton).

Chatoessus chacunda Borodin: Vanderbilt Mus., Bull., vol. 1, art. 3, p. 70, 1932 (Noumea, New Caledonia, Coral Sea).

ENGRAULIDAE

Anchoviella heterolobus (Rüppell).*

Engraulis heteroloba Rüppell: Neue Wirbelth., Fische, p. 79, pl. 21, fig. 4, 1835 (type loc., Massaua, Red Sea).

Engraulis heterolobus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 4, Oct.-Dec. 1931 (Tulagi, Solomons).

Previously known only from the Red Sea, East Indies and Australia.

Anchoviella insularum (Jordan and Seale).*

Stolephorus insularum Jordan and Seale: Mus. Comp. Zool., Bull., vol. 67, no. 11, p. 381, May 1926 (type loc., Tahiti).

Resembles *Anchoviella indica*, with which it may be synonymous.

Anchoviella purpurea (Fowler).

Anchoviella purpurea Jordan and Seale: Mus. Comp. Zool., Bull., vol. 67, no. 11, p. 403 (Oahu, Honolulu).

In "Fishes of Oceania" this and the following are included in *Engraulis*:

Anchoviella apiensis (Jordan and Seale).

Anchoviella indica (Van Hasselt).

Engraulis mauii (Fowler and Bean) in "Fishes of Oceania" should be deleted as it is properly a synonym of *Engraulis australis* (White) of Australia and New Zealand. It was described with wrong locality as Maui, Hawaiian islands.

Thrissocles scratchleyi (Ramsay and Ogilby).

Type of *Engraulis scratchleyi* from the Strickland River, New Guinea, in the Australian Museum (Whitley).

In the "Fishes of Oceania" and "Supplement 1" this and the following are also all included in *Engraulis*:

Thrissocles baelama (Forskål).

Thrissocles macrops (Kishinouye).

Thrissocles mystax (Schneider).

Thrissocles purava (Buchanan-Hamilton).

Thrissocles setirostris (Broussonet)

Thrissocles dussumieri (Valenciennes).

MURAENIDAE

Muraena reinhardti (Steindachner).

Several examples in the Australian Museum as *Anguilla reinhardtii* from New Caledonia, 300 mm long (Whitley).

Muraena mauritiana (Bennett).

Anguilla mauritiana Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 2, Jan.-Mar. 1932 (Tahiti).

Muraena mauritiana Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 25, p. 3, 1932 (Vaikeu, Taiohae Valley, Nukuhiva, Marquesas Islands).

Muraena maculata Gray: Cat. Spec. Roy. College Surg., p. 3, 1859 (caught in the act of climbing up the rudder chains of H. M. S. *Vindictive*, at anchor in the harbor of Tahiti, in 1843).

Examples in the Australian Museum identified by Schmidt as *Anguilla mauritiana* from Peu, Vanikoro, Santa Cruz Group; one 200 mm long from Narokoro koyawa, Fiji (Whitley).

Muraena celebesensis (Kaup).

Anguilla celebensis Giltay: Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 33, 1933 (Sorong, New Guinea).

One 432 mm long from Duke of York Island, as *Anguilla obscura*, in the Australian Museum (Whitley).

Muraena australis (Richardson).

Anguilla australis Pietschmann: B. P. Bishop Mus., Bull. 73, p. 5, 1930 (Malailoa, Tutuila, Samoa, in fresh water).

MUROENESOCIDAE (= MURAENESOCIDAE)

Muroenesox arabicus (Schneider).

Hood Bay, New Guinea. Collection Goldie, 1883 (Whitley).

In "Fishes of Oceania" this species as *Muraenesox cinereus*, should be changed as above, also the following:

Muroenesox talabonoides (Bleeker).

CONGRIDAE

Conger cinereus Rüppell.

Leptocephalus marginatus Pietschmann: B. P. Bishop Mus., Bull. 73, p. 5, 1930 (near Pearl and Hermes Reef).

One from New Hebrides; Hood Bay, New Guinea, collection Goldie, 1883 (Whitley).

Conger conger (Linnaeus).*

Muraena conger Linnaeus: Syst. Nat., ed. 10, pt. 1, p. 245, 1758 (type loc., European Seas; on Artedi).

In the Australian Museum a specimen as *Leptocephalus conger* from the New Hebrides (Whitley).

Ariosoma bowersi (Jenkins).

One in the Australian Museum from Hawaii (Whitley).

Ariosoma anago (Schlegel).*

Conger anago Schlegel: Fauna Japonica, Poiss., pts. 10-14, p. 259, pl. 113, fig. 1, 1846 (type loc., Nagasaki Bay). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 71, 1932 (Suva, Fiji).

Borodin describes his specimens with dorsal and anal black-bordered and black spot at pectoral tip.

Leptocephalus manokwariensis Giltay.*

Leptocephalus manokwariensis Giltay: Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 38, fig. 12, 1933 (type loc. Manokwari, New Guinea).

Length of larva 59 mm.

Leptocephalus schmidti Weber.*

Leptocephalus schmidti Weber: Siboga Exped., vol. 57, Fische, p. 74, 1913 (type loc., Bima Bay). Giltay: Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 38, fig. 13, 1933 (Manokwari, New Guinea).

Leptocephalus taenia Lesson.

Leptocephalus taenia Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 82, 1931 (lat. 0° 4′ N., long. 145° 45′ E.).

ECHELIDAE

Muraenichthys huysmani (Weber).*

Sphagebranchus huysmani Weber: Siboga Exped., vol. 57, Fische, p. 48, 1913 (type loc., Molo Strait, 69 to 91 meters).

Muraenichthys huysmani Giltay: Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 37, fig. 11 (head), 1933 (Manokwari, New Guinea).

Previously known only from Molo Strait, Flores.

Paramyrus kellersi Fowler.*

Paramyrus kellersi Fowler: U. S. Nat. Mus., Proc., vol. 81, art. 8, p. 1, fig. 1, 1932 (type loc., Niuafoou Island).

OPHICHTHYIDAE

Myrichthys colubrinus (Boddaert).

Examples in the Australian Museum from Funafuti, Gilbert and Ellice Islands; Suwarow Island; Duke of York Island; New Britain; New Hebrides; Fiji; Howla Island, Solomons (Whitley).

Myrichthys maculosus (Cuvier).

One from Vaté, New Hebrides (Whitley).

Stethopterus semicinctus (Lay and Bennett).

Stethopterus semicinctus Fowler: U. S. Nat. Mus., Proc., vol. 81, art. 8, p. 2, 1932 (Niuafoou Island).

Examples in the Australian Museum from Reef Island, Santa Cruz Group, and New Hebrides (Whitley).

In "Fishes of Oceania" and "Supplement 1" the genus *Leiuranus* should be supressed in favor of *Stethopterus*.

Pisodonophis boro (Buchanan-Hamilton).

Pisodonophis boro Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 3, Aug. 1932 (Suva).

The other species of this genus in "Fishes of Oceania" and "Supplement 1" should have the generic name spelled as above:

Pisodonophis hypselopterus (Bleeker).

Pisodonophis cancrivorus (Richardson).

Ophichthus apicalis (Bennett).*

Ophisurus apicalis Bennett: Life of Raffles, p. 692, 1830 (type loc., Sumatra).

Ophisurus spadiceus Gray: Descr. Cat. Spec. Roy. College Surg., p. 4, 1859 (Tongataboo).

Known previously from Madagascar, East Indies, Philippines, and China.

Ophichthus calamus Günther.

Jenkinsella mcgregori Ginsburg: B. P. Bishop Mus., Bull. 107, p. 19, 1933 (Pearl and Hermes Reef).

Ophichthus polyophthalmus Bleeker.

Ophichthus polyophthalmus Ginsburg: B. P. Bishop Mus., Bull. 107, p. 19, 1933 (Pearl and Hermes Reef).

Ophichthys (Callechelys) punctulatus Pietschmann: B. P. Bishop Mus., Bull. 73, p. 5, fig. 2 (front part of body), 1930 (Hitiaa District, Tahiti, Society Islands).

Examples in the Australian Museum as *Sphagebranchus polyophthalmus* from Malekula and Santo, New Hebrides (Whitley).

Ophisurus serpens (Linnaeus).*

Muraena serpens Linnaeus: Syst. Nat., ed. 10, pt. 1, p. 244, 1758 (type loc., in southern European Ocean).

Ophisurus serpens Gray: Descr. Cat. Spec. Roy. College Surg., p. 4, 1859 (Tongataboo).

Previously reported from the Mediterranean, eastern Atlantic, South Africa, Australia, and Japan.

Brachysomophis kampeni (Weber and Beaufort).

Achirophichthys kampeni Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 3, Jan.-Mar. 1923 (fresh waters of Tahiti).

Caecula polyophthalma (Bleeker).

Caecula polyophthalmus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 25, p. 3, 1932 (Tahauku Bay, Hivaoa, Marquesas Islands) (error).

RATABOURIDAE (=MORINGUIDAE)

Rataboura javanica (Kaup).

Aphthalmichthys javanicus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 11, Oct.-Dec. 1931 (New Hebrides).

The earliest name for this genus is *Rataboura* Gray 1831. The other species in "Fishes of Oceania" and "Supplement 1" will then stand as:

Rataboura bicolor (Kaup).

Rataboura microchir (Bleeker).

Moringua microchir Herre: Pan-Pac. Research Inst., Jour., vol. 8, no. 4, p. 12, Oct.-Dec. 1933 (Madang, New Guinea).

Rataboura macrocephala (Bleeker).

Rataboura abbreviata (Bleeker).

Moringua abbreviata Giltay: Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 35, 1933 (Manokwari, New Guinea).

ECHIDNIDAE

Echidna zebra (Shaw).

Examples in the Australian Museum from Vila, New Hebrides, and Samoa (Whitley).

Echidna polyzona (Richardson).

Examples in the Australian Museum from Bougainville, Solomons; Malekula, New Hebrides; Haapia, Friendly Islands; Duke of York Island (Whitley).

Echidna nebulosa (Ahl).

Echidna nebulosa Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 11, Oct.-Dec. 1931 (New Hebrides); vol. 7, no. 1, p. 3, Jan.-Mar. 1932 (Tahiti); vol. 8, no. 4, p. 12, Oct.-Dec. 1933 (Madang, New Guinea).

Gymnothorax nebulosus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 72, 1932 (Apia, Samoa; Anaho Bay, Nukuhiva, Marquesas Islands).

Materials in the Australian Museum from Samoa; New Hebrides; reef off Peleni Island, Reef Island, Santa Cruz Group (Whitley).

Echidna delicatula (Kaup).

Samoan specimens in the Australian Museum as *E. delicatula* and *E. trossula* (Whitley).

Evenchelys macrurus (Bleeker).

Evenchelys macrurus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 3, Aug. 1932 (Suva).

Muraena macrura Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 71, 1932 (Uturoa, Raiatea Island, Society Islands).

Muraenophis pardalis (Schlegel).

Muraena kailuae Pietschmann: B. P. Bishop Mus., Bull. 73, p. 6, 1930 (Ewa, south coast of Oahu).

Pseudechidna brummeri (Bleeker).

In "Fishes of Oceania" and "Supplement 1" the name *Strophidon brummeri* should be changed to the above.

Lycodontis picta (Ahl).

Gymnothorax pictus Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 3, Jan.-Mar. 1932 (Tahiti). Giltay: Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 34, 1933 (Pisang Island, New Guinea).

Australian Museum materials from Vate and Vila, New Hebrides; Samoa; Carlyle Bay, Santa Cruz Group; St. Anna, Solomons; Haapai, Friendly Islands; Pleasant Island; Vaitupu, Ellice Islands; Suva, Fiji, from J. S. Callaghan; German New Guinea as *Sidera picta;* as "Pusi kena" or spotted reef eel from Vaitupu (Whitley).

Lycodontis meleagris (Shaw and Nodder).

Lycodontis meleagris Fowler: U. S. Nat. Mus., Proc., vol. 81, art. 8, p. 2, 1932 (Niuafoou). Ginsburg: B. P. Bishop Mus., Bull. 107, p. 19, 1933 (Pearl and Hermes Reef).

Gymnothorax gilberti Tanaka: College Sci. Tokyo, Jour., vol. 23, p. 25, 1910 (type loc., Bonin Islands).

One in the Australian Museum as *Gymnothorax duivenbodii?* from Duke of York Island (Whitley).

One, 160 mm, in B. P. Bishop Museum, an old specimen labeled "New Zealand, from Travers?" though this locality very doubtful. The specimen was more likely obtained in Oceania. Its color pattern approaches that of the nominal young form *Gymnothorax ercodes.*

The account of *Gymnothorax gilberti* shows it to be an apparent synonym of the present species:

Tail little longer than head and trunk. Upper teeth biserial, lower uniserial on sides of jaws; 2 large depressible fangs on vomes. Body thickly covered with small brown spots, variably round, long or curved, larger posteriorly.

Lycodontis ruppelli (McClelland).

Lycodontis rupelli Fowler: U. S. Nat. Mus., Proc., vol. 81, art. 8, p. 3, 1932 (Niuafoou).

One in Australian Museum as *Gymnothorax ruppellii* from Haapai, Friendly Islands (Whitley).

Lycodontis flavomarginata (Rüppell).

Lycodontis flavomarginata Fowler: U. S. Nat. Mus., Proc., vol. 81, art. 8, p. 2, 1932 (Niuafoou).

Examples in the Australian Museum as *Gymnothorax flavomarginatus* from the New Hebrides and Ocean Island; from Funafuti as *Muraena buroensis* and *M. formosa* (Whitley).

Lycodontis kidako (Schlegel).

Gymnothorax steindachneri Pietschmann: B. P. Bishop Mus., Bull. 73, p. 6, 1930 (Pearl and Hermes Reef). Ginsburg: B. P. Bishop Mus., Bull. 107, p. 19, 1933 (Pearl and Hermes Reef).

Lycodontis undulata (Lacépède).

Gymnothorax undulatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 4, Oct.-Dec. 1931 (Tenibuli, Ysabel Island, Solomons). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 71, 1932 (Apia, Samoa).

Thyrsoidea bullata Gray: Descr. Cat. Spec. Roy. College Surg., pp. 4, 135, 1859 (Tongataboo).

One in Australian Museum as *Gymnothorax fimbriata* from Haapai, Friendly Islands; as *G. stellatus* from New Hebrides, Samoa and Bougainville in the Solomons; Hood Bay, New Guinea: one from Samoa as *G. undulatus* (Whitley).

Lycodontis favaginea (Schneider).

Australian Museum specimens from Ocean Island and Narokorokoyawa, Fiji (Whitley).

Lycodontis chilospila (Bleeker).

Gymnothorax chilospilus Giltay: Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 34, 1933 (Sorong, New Guinea).

One in the Australian Museum from the New Hebrides (Whitley).

Lycodontis richardsonii (Bleeker).

Gymnothorax richardsoni Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 3, Jan.-Mar. 1932 (Tahiti).

Lycodontis cribroris (Whitley).*

Gymnothorax cribroris Whitley: Austral. Mus., Rec., vol. 18, no. 6, p. 330, 1932 (type loc., North-West Islet, Queensland; Rarotonga).

Lycodontis mindanoensis (Borodin).*

Gymnothorax mindanoensis Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 2, p. 43, pl. 1, fig. 1, 1930 (type loc., Mindanao, Philippines); vol. 1, art. 3, p. 72, 1932 (Borabora, Society Islands).

Lycodontis nudivomer (Günther).

Lycodontis nudivomer Fowler: U. S. Nat. Mus., Proc., vol. 80, art. 6, p. 3, 1931 (Ua Huka, Marquesas Islands).

Lycodontis punctato-fasciatus (Bleeker).*

Gymnothorax punctato-fasciatus Bleeker: Nederl. Tyds. Dierk., vol. 1, p. 167, 1863 (on Bleeker 1856).

Gymnothorax punctatofasciatus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 72, 1932 (Borabora, Society Islands).

Muraena catenata (not Richardson) Bleeker: Soc. Sci. Ind. Neerl., Act., (Amboina) vol. 1, p. 66, 1856 (type loc., Amboina).

Lycodontis reticularis (Bloch).*

Gymnothorax reticularis Bloch: Naturgesch. ausland. Fische., vol. 9, p. 85, 1795 (type loc., Tranquebar).

One in the Australian Museum from the New Hebrides (Whitley).

Enchelynassa canina (Quoy and Gaimard).

Enchelynassa canina Fowler: U. S. Nat. Mus., Proc., vol. 81, art. 8, p. 3, 1932 (Niuafoou).

Uropterygius tigrinus (Lesson).

Scutitaria tigrina Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 2, p. 43, 1930 (Pearl Harbor, Oahu) (error).

Uropterygius concolor Rüppell.

Gymnomuraena concolor Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 82, 1931 (Kewieng Nusa, north coast New Mecklenburg).

Uropterygius concolor Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 11, Oct-Dec. 1931 (New Hebrides); vol. 7, no. 1, p. 3, Jan.-Mar. 1932 (Tahiti).

One in Australian Museum as *Anarchias knighti* from Aneiteum, New Hebrides (Whitley).

Uropterygius macrocephalus (Bleeker).

One in Australian Museum from Samoa; one from reef at Vila, New Hebrides, as *Scuticaria pantherina* (Whitley).

Uropterygius marmoratus (Lacépède).

Gymnomuraena marmorata Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 82, 1931 (Kelana Harbor, New Guinea; Linden Harbor, south coast New Pomerania). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 72, 1932 (Anaho Bay, Nukuhiva, Marquesas Islands).

Uropterygius marmoratus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 11, Oct.-Dec. 1931 (New Hebrides). Fowler: U. S. Nat. Mus., Proc., vol. 81, art. 8, p. 3, 1932 (Niuafoou).

One in the Australian Museum from New Hebrides; German New Guinea (Whitley).

Prymnothonus hookeri Richardson.*

Prymnothonus hookeri Richardson: Voy. Erebus and Terror, Ichth., p. 51, pl. 30, fig. 6-7, 1844-48 (type loc., "no locality"). Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil, vol. 44, p. 82, fig. 9, 1931 (south coast Linden Harbor, New Pomerania) (error).

A larval form.

CYPRINIDAE

Carassius auratus (Linnaeus).

In Bernice P. Bishop Museum one example of

this introduced species from stream in Haiku Valley, Maui, Degener, 1927, length 35 mm.

COBITIDAE

Misgurnis anguillicaudatus (Cantor).

In Bernice P. Bishop Museum two, 103 to 112 mm, also an introduced species from Asia, obtained in Manoa Valley stream, Oahu, in Oct. and Dec. respectively, 1928, by C. H. Edmondson.

TACHYSURIDAE

Tachysurus spatula (Ramsay and Ogilby).

Type of *Arius spatula* 305 mm long from the Strickland River, New Guinea, in the Australian Museum (Whitley).

Tachysurus latirostris (Macleay).

Types of *Arius latirostris* 153 to 610 mm long from the Goldie River, New Guinea, in the Australian Museum (Whitley).

Tachysurus froggatti (Ramsay and Ogilby).

Material as *Arius froggatti* from the Strickland River in New Guinea, in the Australian Museum (Whitley).

Nedystoma dayi (Ramsay and Ogilby).

Paratype of *Hemipimelodus* dayi 125 to 200 mm long, from Strickland River, New Guinea (Whitley).

Hemipimelodus crassilabris Ramsay and Ogilby.

Materials from Strickland River in Australian Museum (Whitley).

PLOTOSIDAE

Plotosus anguillaris (Bloch).

Plotosus anguillaris Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 4, Aug. 1932 (Suva).

Plotosus arab Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 73, 1932 (Pago Pago, Samoa).

Material in Australian Museum from Fiji: Hood Bay, New Guinea (Whitley).

AULOPIDAE

Chlorophthalmus proridens Gilbert and Cramer.

Example in Australian Museum from Hawaii (Whitley).

SYNODONTIDAE

Trachinocephalus myops (Schneider).

Australian Museum materials from Epi Island, New Hebrides, and Hawaii (Whitley).

Synodus japonicus (Houttuyn).

Synodus japonicus Fowler: U. S. Nat. Mus., Proc., vol. 80, art. 6, p. 4, 1931 (Nukuhiva).—Herre: Pan-Pac. Research Inst., Jour., vol. 8, no. 4, p. 12, Oct.-Dec. 1933 (Madang, New Guinea).

Hawaiian example in the Australian Museum (Whitley).

Saurida gracilis (Quoy and Gaimard).

Saurus variegatus Giltay: Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 40, 1933 (Manokwari, New Guinea).

Saurida nebulosa Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 73, 1932 (Raiatea, Society Islands).

Examples in the Australian Museum from Hawaii and Suwarow Island (Whitley).

Saurida grandisquamis Günther.

Saurida grandisquamis Günther: Mus. Godeffroy, Jour., vol. 3, pt. 6, p. 377, 1909-10 (compiled).

MYCTOPHIDAE

Myctophum nigro-ocellatum (Günther).

Scopelus nigro-ocellatus Günther: Mus. Godeffroy, Jour., vol. 1, pt. 4, no. 4, p. 91, 1873 (type loc., South Atlantic Ocean).

Scopelus nigro-ocellatus Günther: Rep. Voy. Challenger, vol. 31, pt. 2, p. 30, 1889 (type; Admiralty Islands to Japan).

Myctophum nigro-ocellatum Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 4, Feb. 1932 (reference).

The reference to *Centrobranchus choerocephalus* in "Fishes of Oceania" will give place to the above name. One in the Australian Museum from the surface near the Hawaiian islands (Whitley).

Myctophum andreae (Lütken).

Myctophum andreae Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 4, Feb. 1932 (correction).

In "Fishes of Oceania" wrongly as *Centrobranchus andrae*.

Myctophum asper (Richardson).

Wrongly *Dasyscopelus asper* in "Fishes of Oceania."

Myctophum pristilepis (Gilbert and Cramer).*

Myctophum pristilepis Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 4, Feb. 1932 (reference).

Dasyscopelus asper (not Richardson) Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 67, 1928 (part).

Myctophum spinosus (Steindachner).

In "Fishes of Oceania" wrongly as *Dasyscopelus spinosus*.

Myctophum aurolaternatum Garman.*

Myctophum aurolaternatum Garman: Mus. Comp. Zool., Mem., vol. 24, p. 264, pl. 55, fig. 3, 1899 (type loc., lat. 6° 21′ N., long. 80° 41′ W., surface).

One in the Australian Museum 75 mm long, from the surface near the Hawaiian islands as *Myctophum aurolaternatum* (Whitley).

Myctophum crenulare Jordan and Gilbert.*

Myctophum crenulare Jordan and Gilbert: U. S. Nat. Mus., Proc., vol. 3, p. 274, 1880 (1881) (type loc., from stomach of *Orcynus alalonga* taken in Santa Barbara Channel, California).

Myctophum affine (not Lütken) Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 69, fig. 13, 1928 (part).

Myctophum fibulatum Gilbert and Cramer.

Myctophum fibulatum Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 4, Feb. 1932 (reference).

Taaning: Medd. Dansk naturh. Foren. Kjobenhavn, Vidensk., vol. 94, p. 131, 1932 (off Samoa).

Myctophum pterotum (not Alcock) Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 70, 1928 (compiled).

Benthosema pinchoti Fowler: U. S. Nat. Mus., Proc., vol. 80, art. 6, p. 4, fig. 1, 1931 (type loc., Nukuhiva, Marquesas Islands).

Myctophum hollandi Jordan and Jordan is more properly a synonym of this species than of *M. reinhardti* (Lütken), with which I placed it in the "Fishes of Oceania."

Myctophum cocco (Cocco).

Rhinoscopelus tenuiculus Gilbert: Am. Mus. Nat. Hist., Bull., vol. 30, art. 2, p. 15, Mar. 10, 1911 (midway between Galapagos and Marquesas Islands).

One in the Australian Museum 45 mm long from the surface near the Hawaiian islands (Whitley).

Myctophum hians Richardson and *Myctophum tenuiculum* Garman, admitted as distinct species in "Supplement 1" and "Fishes of Oceania" are synonyms of the present species and should therefore be suppressed.

Diaphus agassizii Gilbert.

Diaphus agassizii Fowler: U. S. Nat. Mus., Proc., vol. 80, art. 6, p. 4, 1931 (Taiohae, Marquesas Islands).

Diaphus rafinesquei (Cocco).

Diaphus rafinesquei Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 4, Feb. 1912 (reference).

Diaphus nanus Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 68, 1928 (types).

Diaphus urolampus Gilbert and Cramer.

Diaphus urolampus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 4, Feb. 1932 (reference).

Diaphus dumerili (not Bleeker) Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 68, 1928 (part).

Diaphus anderseni Taaning.*

Diaphus anderseni Taaning: Medd. Dansk naturh. Foren. Kjöbenhavn, Vidensk., vol. 94, p. 134, fig. 6, 1932 (type loc., southwest of Fiji Islands, lat. 20° S., long. 174° 29′ W.).

Diaphus parri Taaning.*

Diaphus parri Taaning: Medd. Dansk naturh. Foren. Kjöbenhavn, Vidensk., vol. 94, p. 135, fig. 7, 1932 (type loc., southeast of New Caledonia, lat. 27° 21′ S., long. 175° 11′ W.).

Diaphus richardsoni Taaning.*

Diaphus richardsoni Taaning: Medd. Dansk naturh. Foren. Kjöbenhavn, Vidensk., vol. 94, p. 136, fig. 8, 1932 (type loc. north of New Guinea, lat. 2° N., long. 138° 22′ E.).

Diaphus schmidti Taaning.*

Diaphus schmidti Taaning: Medd. Dansk naturh. Foren. Kjöbenhavn, Vidensk., vol. 94, p. 139, fig. 11, 1932 (type loc., north of Samoa, lat. 7° 46′ S., long. 167° 10′ W.).

Diaphus regani Taaning.*

Diaphus regani Taaning: Medd. Dansk naturh. Foren. Kjöbenhavn, Vidensk., vol. 94, p. 139, fig. 12, 1932 (type loc., off New Caledonia, lat. 20° 53.2′ S., long. 164° 03.3′).

Diaphus jenseni Taaning.*

Diaphus jenseni Taaning: Medd. Dansk naturh. Foren. Kjöbenhavn, Vidensk., vol. 94, p. 141, fig. 14, 1932 (type loc., north of New Guinea, lat. 3° 18′ N., long. 129° 2′ W.).

Diaphus astridae Giltay.*

Diaphus astridae Giltay: Soc. Roy. Zool. Belge, Ann., vol. 60, p. 29, 1929 (type loc., Manokwari, New Guinea); Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 41, 1933, figs. 14-15, (type).

Described from a single specimen 39 mm long.

POECILIIDAE

Lebistes reticulatus (Peters).

Lebistes reticulatus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 4, Feb. 1932 (Samoa: introduced); no. 25, p. 5, fig 1 (variation), 1932 (introduced, Lake Vaihiria, Tahiti, Society Islands).

BELONIDAE

Belone platyura Bennett.

Belone platyura Fowler: U. S. Nat. Mus., Proc., vol. 81, art. 8, p. 3, 1932 (Niuafoou).—Ginsburg: B. P. Bishop Mus., Bull. 107, p. 20, 1933 (Pearl and Hermes Reef).

Ocean Island, Funafuti, and New Hebrides, one from the last locality 355 mm (Whitley).

Strongylura incisa (Valenciennes).

Strongylura incisa Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 4, Aug. 1932 (Suva).

Strongylura indica (Le Sueur).

Strongylura indica Fowler: U. S. Nat. Mus., Proc., vol. 80, art. 6, p. 5, 1931 (Nukuhiva).

Hawaiian materials in the Australian Museum (Whitley).

Strongylura choram (Rüppell).

Belone choram Borodin: Vanderbilt Marine Mus. Bull., vol. 1, art. 3, p. 73, 1932 (Raiatea, Society Islands; Borabora, Society Islands).

Tongan material in the Australian Museum (Whitley).

Strongylura crocodila (Le Sueur).

Tylosurus melanotus Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 3, Jan.-Mar. 1933 (Tahiti).

Ablennes hians (Valenciennes).

Hawaiian materials in the Australian Museum (Whitley).

HEMIRAMPHIDAE

Euleptorhamphus viridis (Van Hasselt).

Hemiramphus viridis Van Hasselt: Sci. Nat. Géol. Férussac, Bull., vol. 2, p. 374, 1824 (on *Kuddera* C. Russell, Fishes of Coromandel, vol. 2, p. 62, pl. 178, 1803, type loc., Vizagapatam, India).

Euleptorhamphus longirostris Putnam: Boston Soc. Nat. Hist., Proc., vol. 13, p. 239, 1870 (Kawaihae, Hawaii).

In "Fishes of Oceania" this species is given under the later name of *Hemiramphus longirostris* Cuvier 1829.

Hemiramphus pacificus Steindachner.

Hemiramphus pacificus Fowler: U. S. Nat. Mus., Proc., vol. 80, art. 6, p. 6, 1932 (Nukuhiva).

Hemiramphus georgii Valenciennes.

Hemiramphus georgii Herre: Pan-Pac. Research Inst., Jour., vol. 8, no. 4, p. 12, Oct.-Dec., 1933 (Madang, New Guinea).

Hemiramphus balinensis Bleeker.

Heriramphus balinensis Herre: Pan-Pac. Research Inst., Jour., vol. 8, no. 4, p. 12, Oct.-Dec. 1933 (Madang, New Guinea).

Funafuti and Samoan specimens in the Australian Museum (Whitley).

Hemiramphus affinis Günther.

Samoa (Whitley).

Hemiramphus brasiliensis (Linnaeus).

Hemiramphus brasiliensis Fowler: U. S. Nat. Mus., Proc., vol. 80, art. 6, p. 6, 1932 (Hivaoa, Marquesas Islands).

Hemiramphus quoyi Valenciennes.

Hemiramphus quoyi Giltay: Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 44, 1933 (Manokwari, New Guinea).

Hemiramphus erythrorinchus Le Sueur.

Hemiramphus dussumieri Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 4, Oct.-Dec. 1931 (Tulagi, Solomons).

Ontong Java material in the Australian Museum (Whitley).

Hemiramphus far (Forskål).

Hemiramphus far Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 4, Oct.-Dec. 1931 (Tenibuli, Solomons). Borodin: Vanderbilt Marine Mus., Bull., vol. 1, art. 3, p. 73, 1932 (Coral Sea, Noumea, New Caledonia).

Peu, Vanikoro; Dutch New Guinea (Whitley).

Hemiramphus praematurus Schindler.*

Hemiramphus praematurus Schindler: B. P. Bishop Mus., Bull. 97, p. 7, pl. 1, fig. *A*, Oct. 1932 (type loc., Hawaiian islands). (Larval.)

Hemiramphus pietschmanni Schindler.*

Hemiramphus pietschmanni Schindler: B. P. Bishop Mus., Bull. 97, p. 7, pl. 1, *B*, Oct. 1932 (type loc., Hawaiian islands). (Larval.)

Zenarchopterus kampeni (Weber).

Zenarchopterus kampeni Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 5, Oct.-Dec. 1931 (Hathorne Sound, Solomons).

Zenarchopterus dispar (Valenciennes).

Zenarchopterus dispar Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 5, Oct.-Dec. 1931 (Auki, Solomons, in fresh water).

Port Moresby, New Guinea; type of *Zenarchopterus vaisiganus* Jordan and Seale 150 mm long from Samoa (Whitley).

EXOCOETIDAE

Parexocoetus brachypterus (Richardson).

Parexocoetus brachypterus Borodin: Vanderbilt Marine Mus., Bull., vol. 1, art. 2, p. 46, 1930 (Ponape, Carolines). Herre: Pan-Pac. Research Inst., Jour., vol. 8, no. 4, p. 12, Oct.-Dec. 1933 (Madang, New Guinea).

Parexocoetus rostratus Herre: Pan-Pac. Research Inst., Jour., vol. 8, no. 4, p. 12, Oct.-Dec. 1933 (Madang, New Guinea).

Parexocoetus melanogenion (Pietschmann).*

Ptenonotus melanogenion Pietschmann: Akad. Wiss. Wien, Anzeiger, vol. 13, 1928 (type loc., Kona, Hawaii); B. P. Bishop Mus., Bull. 73, p. 8, pl. 2, *B*, 1930 (type).

Differs from *Parexocoetus cirriger* (Peters) in its higher body, form and color of barbels, and length and shape of fins, especially dorsal and ventral. According to Nichols and Breeder this is a barbeled form of *Parexocoetus* (Copeia, no. 3, p. 89, Sept. 30, 1930).

Oxyporhamphus argenteus (F. D. Bennett).

Hemiramphus argenteus F. D. Bennett: Nar. Whaling Voy., vol. 2, p. 269, woodcut, 1840 (type loc., 3° S., 5° N., Pacific Ocean). Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 78, 1928 (compiled; remarks).

Hemiramphus cuspidatus Valenciennes: Hist. Nat. Poiss., vol. 19, p. 56, 1846 (type loc., Sea of the Indies, taken from a bonito).

Evolantia microptera Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 80, 1928 (Kingsmills; Phoenix Islands).

From the above it may be seen that the proper name of the short-finned flying fish becomes *Oxyporhamphus argenteus*. In the "Fishes of Oceania" Bennett's reference was wrongly included in the Hemiramphidae, where all previous authors had placed it.

Exocoetus volitans Linnaeus.

Exocoetus volitans Fowler: U. S. Nat. Mus., Proc., vol. 80, art. 6, p. 6, 1932 (lat. 3° S., long. 108° W., 100 miles east of Tahiti). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 11, Oct.-Dec. 1931 (New Hebrides).

New Hebrides materials in the Australian Museum (Whitley).

Cypselurus oxycephalus (Bleeker).

Materials from eastward of Fiji and New Hebrides in the Australian Museum (Whitley).

Cypselurus rubescens (Rafinesque).

Cypeselurus rubescens Fowler: U. S. Nat. Mus., Proc., vol. 80, no. 8, art. 6, 1932 (lat. 7° S., long. 124° W.).

Cypselurus arcticeps (Günther).

Southeast coast of New Guinea (Whitley).

Cypselurus nigricans (Bennett).

Cypselurus nigricans Giltay: Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 46, 1933 (Manokwari, New Guinea).

Cypselurus altipennis (Valenciennes).

Cypselurus altipennis Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 11, Dec. 1931 (New Hebrides).

Cypselurus poecilopterus (Valenciennes).

Exocoetus poecilopterus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 73, 1932 (Coral Sea, New Hebrides, wrongly "Hybrides").

Cypselurus poecilopterus Giltay: Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 46, 1933 (Manokwari, New Guinea).

Cypselurus atrisignis Jenkins.

Cypselurus atrisignis Fowler: U. S. Nat. Mus., Proc., vol. 80, art 6, p. 6, 1932 (north of Tuamotu Islands).

Cypselurus gregoryi Pietschmann.*

Cypselurus gregoryi Pietschmann: B. P. Bishop Mus., Bull. 73, p. 7, pl. 2, *A*, 1930 (type loc., Pearl and Hermes Reef).

Differs from *Cypselurus atrisignis* Jenkins in longer pectorals and longer ventrals, besides coloration.

Cypselurus spilopterus (Valenciennes).

Cypselurus spilopterus Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 3, Jan.-Mar. 1932 (Tahiti).

Cypselurus naresii (Günther).

Exocoetus naresii Günther: Voy. Challenger, Rep., vol. 31, pt. 2, p. 36, pl. 1, *A*, 1888 (type loc., between Fiji and New Hebrides).

Cypsilurus naresi Giltay: Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 47, 1933 (Manokwari, New Guinea).

Known from Polynesia and the East Indies.

Cypselurus oligolepis (Bleeker).

Cypselurus oligolepis Herre: Pan-Pac. Research Inst., Jour., vol. 8, no. 4, p. 12, Oct.-Dec. 1933 (Madang, New Guinea).

Cypsilurus oligolepis Giltay: Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 47, 1933 (Manokwari, New Guinea).

Cypselurus bahiensis (Ranzani).

Off Atupua, Santa Cruz Group; one from New Hebrides 342 mm long (Whitley).

Cypselurus cribrosus (Kner).*

Exocoetus cribrosa Kner: Reise Novara, Fische, p. 326, 1865 (type loc., Sydney: alternative name for *Exocoetus unicolor*, not Valenciennes, Kner).

Exonautes rondeletii (not Valenciennes) Waite, Australian Mus., Rec., vol. 5, pp. 156, 195, 1904 (Admiralty Islands).

CORYPHAENOIDIDAE

Coryphaenoides gibber (Gilbert and Cramer).

Hawaiian material in the Australian Museum as *Macrurus gibber* (Whitley).

Malacocephalus hawaiiensis Gilbert.

Hawaiian islands (Whitley).

Mataeocephalus acipenserinus (Gilbert and Cramer).

Hawaiian islands (Whitley).

BREGMACEROTIDAE

Bregmaceros mcclellandii Thompson.

Bregmaceros mcclellandi Herre: Pan-Pac. Research Inst., Jour., vol. 8, no. 4, p. 12, Oct.-Dec. 1933 (Madang, New Guinea).

LAMPRIDAE

Lampris regius (Bonnaterre).

Dr. H. M. Smith calls my attention to the scale line of 140 cm as printed below the figure of this species on page 89 in "Fishes of Oceania." This is erroneous and was intended to read 140 mm. As the description gives 1185 mm a computation of the size of the figure on 140 mm basis would bring it within these dimensions.

PLEURONECTIDAE

Platophrys mancus (Broussonet).

Vaitupu, Ellice Islands, as "Ali"; Rarotonga, Harvey Group; Honolulu (Whitley).

Platophrys pantherinus (Rüppell).

Platophrys panterinus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 2, p. 46, 1930 (Honolulu) (error).

Platophrys pantherinus Ginsburg: B. P. Bishop Mus., Bull. 107, p. 20, 1933 (Pearl and Hermes Reef).

Bothus pantherinus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 74, 1932 (Raiatea, Society Islands).

In the Australian Museum material from Funafuti, Pakea in Banks Group, Pleasant Island, and Hawaiian islands (Whitley).

Engyprosopon fijiensis Norman.*

Engyprosopon fijiensis Norman: Ann. Mag. Nat. Hist., ser. 10, vol. 8, p. 508, Nov. 1931 (type loc., Fiji Islands).

Rhomboidichthys species Günther: Voy. Challenger, Rep., vol. 1, pt. 6, p. 36, 1880 (Levuka) (reference only).

Pelecanichthys crumenalis Gilbert and Cramer.

Material from off Oahu, Hawaiian islands (Whitley).

Pseudorhombus guttulatus Macleay.

Hood Bay, New Guinea (Whitley).

SOLEIDAE

Pardachirus pavoninus (Lacépède).

Ysabel, Solomons, and New Hebrides (Whitley). Norman has shown that *Solea persimilis* Günther is a synonym of the present species. Wrongly entered in "Fishes of Oceania" on page 94 as *Asseraggodes persimilis* and therefore should be suppressed.

Synaptura orientalis (Schneider).*

Pleuronectes orientalis Schneider: Syst. Ichth. Bloch, p. 157, 1801 (type loc., Tranquebar).

?Synaptura pan (not Buchanan-Hamilton) Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 74, 1932 (Noumea, New Caledonia).

MELAMPHAIDAE

Melamphaes crassiceps (Günther).*

Scopelus crassiceps Günther: Ann. Mag. Nat. Hist., ser. 5, vol. 2, p. 185, 1878 (type loc., Atlantic; Antarctic; 675 to 1500 fathoms).

Melamphaes crassiceps Günther: Voy. Challenger, Rep., vol. 22, p. 28, pl. 8, *B*, 1887 (north of New Guinea, 1100 fathoms).

ANOMALOPIDAE

Anomalops katoptron (Bleeker).

Material as *Anomalops palpebratus* from the New Hebrides in the Australian Museum (Whitley).

HOLOCENTRIDAE

Holocentrus ruber (Forskål).

Holocentrus ruber Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 11, Oct.-Dec. 1931 (New Hebrides). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 4, Feb. 1932 (Pago Pago).

Holocentrum rubrum Duncker and Mohr: Naturh.

Mus. Hamburg, Mitteil., vol. 44, p. 71, 1931 (Linden Harbor, south coast of New Pomerania; Kelanda Harbor, New Guinea). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 75, 1932 (Noumea, New Caledonia; Pago Pago, Samoa; Venus Point Reef, Tahiti).

Port Moresby, New Guinea (Whitley).

Holocentrus caudimaculatus Rüppell.

Holocentrus caudimaculatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 5, Oct.-Dec. 1931 (Tenibuli, Solomons); vol. 7, no. 1, p. 3, Jan.-Mar. 1932 (Tahiti).

Holocentrus rubellio Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 10, Jan.-Mar. 1932 (Moorea, Society Islands).

Samoan materials in the Australian Museum (Whitley).

Holocentrus binotatus Quoy and Gaimard.

Holocentrus binotatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 5, Oct.-Dec. 1931 (Tenibuli, Solomons).

Holocentrus unipunctatus Günther.

Holocentrus unipunctatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 5, Oct.-Dec. 1931 (Auki, Hathorne Sound and Tenibuli, Solomons). Fowler, B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 4, Feb. 1932 (Pago Pago; description).

Holocentrus erythraeus Günther.

Material from Santo, New Hebrides, and Funafuti in the Australian Museum (Whitley).

Holocentrus tiereoides Bleeker.

Holocentrum tieroides Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 71, 1931 (Varangoi, south coast of New Pomerania).

Holocentrus tiereoides Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 11, Oct.-Dec. 1931 (New Hebrides); vol. 7, no. 1, p. 3, Jan.-Mar. 1932 (Tahiti).

Holocentrus lacteoguttatus Cuvier.

Holocentrus lacteo-guttatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 5, Oct.-Dec. 1931 (Tenibuli, Solomons).

Holocentrus lacteoguttatus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 5, Feb. 1932 (Apia).

Holocentrum lacteoguttatum Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 75, 1932 (Papeete, Tahiti).

Funafuti and Apia materials in the Australian Museum (Whitley).

Holocentrus xantherythrus Jordan and Evermann. Hawaiian islands (Whitley).

Holocentrus laevis Günther.

Holocentrus laevis Herre: Pan-Pac. Research Jour., vol. 6, no. 4, p. 5, Oct.-Dec. 1931 (Tenibuli, Solomons); vol. 7, no. 1, p. 3, Jan.-Mar. 1932 (Tahiti).

Holocentrum sammara variety *laeve* Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 75, 1932 (Poonaruu Reef, Tahiti).

Solomon Islands ? and New Guinea material in the Australian Museum (Whitley).

Holocentrus cornutus Bleeker.*

Holocentrum cornutum Bleeker: Nat. Tijds. Ned. Indie, vol. 5, p. 240, 1853 (type loc., Ceram, in rivers; Amboina, in sea).

Holocentrus cornutus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 5, Oct.-Dec. 1931 (Tenibuli, Solomons); vol. 8, no. 4, p. 12, Oct.-Dec. 1933 (Madang, New Guinea).

Dutch New Guinea (Whitley). This species known from the East Indies and Philippines, though Herre's record extends its range into Oceania.

Holocentrus furcatus Günther.

Materials in the Australian Museum from the Hawaiian islands (Whitley).

Holocentrus violaceus Bleeker.

Holocentrum violaceum Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 70, 1931 (south coast of New Pomerania).

Holocentrus violaceus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 5, Oct.-Dec. 1931 (Hathorne Sound and Tenibuli, Solomons).

Samoan materials in the Australian Museum (Whitley).

Holocentrus diadema Lacépède.

Holocentrus diadema Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 5, Oct.-Dec. 1931 (Tenibuli, Solomons), p. 10 (Moorea, Society Islands); vol. 7, no. 1, p. 3, Jan.-Mar. 1932 (Tahiti). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 5, Feb. 1932 (Pago Pago).

Holocentrum diadema Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 75, 1932 (Noumea, New Caledonia; Pago Pago, Samoa).

Samoa, Admiralty Islands, and New Guinea (Whitley).

Holocentrus microstomus Günther.

Holocentrus microstomus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 11, Oct.-Dec. 1931 (New Hebrides). Fowler, B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 5, Feb. 1932 (Fagamalo, Samoa).

Holocentrum microstoma Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 75, 1932 (Raiatea, Society Islands; Apia, Samoa).

Holocentrum argenteum (not Valenciennes) Bleeker: Ned. Tijds. Dierk., vol. 4, p. 208, 1874 (Geelvink Bay, New Guinea). Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 72, 1931 (south coast of New Pomerania).

Holocentrus diadema (not Lacépède) Fowler and Silvester: Carnegie Inst. Washington, Mar. Papers, p. 116, 1922 (Pago Pago).

Materials from Vila, New Hebrides, and Samoa in the Australian Museum (Whitley). One specimen I reported as *Holocentrus diadema* with Captain Silvester, I find on reëxamination to belong to this species.

Holocentrus spinifer (Forskål).

Holocentrus spinifer Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 5, Oct.-Dec. 1931 (Tenibuli, Solomons). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 4, Aug. 1932 (Suva).

Bougainville in Solomons, New Hebrides, and Samoa (Whitley).

Holocentrus sammara (Forskål).

Holocentrus sammara Herre: Pan-Pac. Research Inst.,

Jour., vol. 6, no. 4, p. 5, Oct.-Dec. 1931 (Tulagi and Ugii, Solomons); p. 10 (Moorea, Society Islands); vol. 7, no. 1, p. 3, Jan.-Mar. 1932 (Tahiti). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 5, Feb. 1932 (Pago Pago).

Holocentrum sammara Duncker and Mohr: Zool. Mus. Hamburg, Mitteil., vol. 44, p. 71, 1931 (St. Matthias, Ekaliu). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 75, 1932 (Apia and Pago Pago, Samoa).

Port Moresby, New Guinea; Hog Harbor, Santo, New Hebrides; Bougainville, Solomon Islands; Admiralty Islands; Tongatabu, Friendly Islands; Samoa (Whitley).

Holocentrus opercularis Valenciennes.

Holocentrus opercularis Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 5, Oct.-Dec. 1931 (Tenibuli, Solomons); vol. 7, no. 1, p. 3, Jan.-Mar. 1932 (Tahiti). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 5, Feb. 1932 (Fagamalo, Samoa).

Holocentrum operculare Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 75, 1932 (Raiatea, Society Islands).

Holotrachys lima (Valenciennes).

Holotrachys lima Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 3, Jan.-Mar. 1932 (Tahiti). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 5, Feb. 1932 (Fagamalo, Samoa).

Myripristis murdjan (Forskål).

Myripristis murdjan Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 70, 1931 (Möwe Harbor, south coast of New Pomerania). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 5, Oct.-Dec. 1931 (Tenibuli, Solomons), p. 10 (Moorea, Society Islands), p. 11 (New Hebrides). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 5, Feb. 1932 (Apia and Fagamalo, Samoa); vol. 9, no. 20, p. 5, Aug. 1932 (Suva).

Myripristis murjan Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 75, 1932 (Raiatea, Society Islands; Apia, Samoa) (error).

Myripristis parvidens Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 70, 1931 (Möwe Harbor, south coast of New Pomerania).

Myripristis adustus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 5, Oct.-Dec. 1931 (Tenibuli, Solomons).

Myripristis microphthalmus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 10, Oct.-Dec. 1931 (Moorea, Society Islands); vol. 7, no. 1, p. 3, Jan-Mar. 1932 (Tahiti).

Myripristis violaceus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 11, Oct.-Dec. 1931 (New Hebrides).

New Guinea, Duke of York Island, New Hebrides and Samoa; Tongatabu as *Myripristis parvidens;* Port Moresby, New Guinea as *Myripristis adustus;* Hood Bay in New Guinea, Gizo in Solomons and Samoa, as *Myripristis microphthalmus* (Whitley). Following Weber and Beaufort *Myripristis violaceus* Bleeker, *Myripristis adustus* Bleeker, *Myripristis microphthalmus* Bleeker and *Myripristis parvidens* Cuvier, all admitted in "Fishes of Oceania," are synonyms of the present species.

Myripristis intermedius Günther.

Myripristis intermedius Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 5, Oct.-Dec. 1931 (Tenibuli, Solomons), p. 10 (Moorea, Society Islands); vol. 7, no. 1, p. 3, Jan.-Mar. 1932 (Tahiti).

Myripristis hexagonus (Lacépède).

Weber and Beaufort place *Myripristis pahudi* Bleeker as a synonym of this species. Though admitted in "Fishes of Oceania", it may therefore be placed with the present species.

Myripristis pralinius Cuvier.

Myripristis pralinius Cuvier: Hist. Nat. Poiss., vol. 3, p. 127, 1829 (type loc., New Ireland). Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 3, Jan.-Mar. 1932 (Tahiti).

Myripristis praslinus Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 10, 1925 (French Frigates Shoal). Fowler: B. P. Bishop Mus., Bull. 38, p. 8, 1927 (French Frigates Shoal), Mem., vol. 10, p. 108, 1928 (types of *Myripristis sanguineus, Myripristis phaeopus* and *Myripristis symmetricus,* Tahiti, French Frigates Shoal, Apia, Easter Island), vol. 11, no. 5, p. 323, 1931 (compiled).

Myripristis symmetricus Borodin: Vanderbilt Mar. Mus., vol. 1, art. 2, p. 47, 1930 (Honolulu).

Myripristis bleekeri Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 70, 1931 (St. Matthias, Ekaliu).

Hog Harbor, Northeast Santo, New Hebrides; Apia, Samoa (Whitley).

Myripristis carneus Ramsay and Ogilby.

Type no. I. 214 Australian Museum, from Admiralty Islands (Whitley).

Myripristis leiognathos Valenciennes.

Myripristis liognathus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 5, Oct.-Dec. 1931 (Tenibuli, Solomons).

Myripristis trachyacron Bleeker.*

Myripristis trachyacron Bleeker: Kon. Akad. Wet. Amsterdam, Versl., vol. 15, p. 24, 1863 (type loc., Hitu, Amboina). Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 5, p. 257, 1929 (type). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 75, 1932 (Noumea, New Caledonia).

The following, without description or figure, is included simply for reference:

Myripristis mooreanus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 10, Oct.-Dec. 1931 (type loc., Moorea, Society Islands).

SYNGNATHIDAE

Syngnathoides biaculeatus (Bloch).

Southeast coast of New Guinea (Whitley).

Choeroichthys sculptus (Günther).

Choerichthys sculptus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 11, Oct.-Dec. 1931 (New Hebrides).

Santo, New Hebrides (Whitley).

Coelonotus platyrhynchus (Duméril).

Coelonotus platyrhynchus Fowler: U. S. Nat. Mus., Proc., vol. 80, art. 6, p. 7, fig. 2, 1932 (Ua Huka, Marquesas Islands); B. P. Bishop Mus., Occ. Papers, vol. 9, no. 25, p. 6, 1932 (Hanavave Valley, Fatuhiva, Marquesas Islands).

Microphis brachyurus (Bleeker).

Microphis brachyurus Pietschmann: B. P. Bishop Mus., Bull. 73, p. 9, 1930 (Papara District, Tahiti). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 11, Oct.-Dec. 1931 (fresh water, Moorea, Society Islands).

Farona Island Reef, Ysabel, Solomons, and Samoan materials in the Australian Museum (Whitley). I have examined one 157 mm long from Raiatea, obtained by Mr. John W. Moore in 1927?, in Bernice P. Bishop Museum.

Doryrhamphinarum of Kaup is of improper form as a generic name. Its genotype as given by Jordan is *Syngnathus deokhata* Buchanan-Hamilton, though Kaup says of it "Ich kenne diesen Fisch nicht in der Natur". It follows, therefore, that his other species, *Syngnathus cuncalus* Buchanan-Hamilton, which he lists from Indian materials in the Paris Museum, should more properly have been selected as the genotype.

Microphis melanopleura (Bleeker).

Material from New Hebrides in the Australian Museum (Whitley). One other species in my "Fishes of Oceania" should now stand as:

Microphis manadensis (Bleeker).

Doryichthys retzii (Bleeker).

Material from Vila, New Hebrides, in the Australian Museum (Whitley).

Ichthyocampus kampeni Weber.

New Hebrides (Whitley).

Ichthyocampus edmondsoni Pietschmann.*

Ichthyocampus edmondsoni Pietschmann: B. P Bishop Mus., Bull. 73, p. 8, fig. 3, 1930 (type loc., Waikiki Reef, Honolulu).

Distinguished by its color marking, D. 20. Rings 14 + 38.

Penetopteryx fowleri Whitley.*

Penetopteryx fowleri Whitley: Australian Mus., Rec., vol. 19, no. 1, p. 65, Aug. 2, 1933 (type loc., New Hebrides).

Syngnathus djarong Bleeker.

Syngnathus djarong Herre: Pan-Pac. Research Inst., Jour., vol. 8, no. 4, p. 12, Oct.-Dec. 1933 (Madang, New Guinea).

Syngnathus spicifer Rüppell.

Syngnathus spicifer Fowler: B. P. Bishop Mus., Occ. Paper, vol. 9, no. 20, p. 5, Aug. 1932 (Suva).

New Hebrides (Whitley).

Syngnathus uncinatus Weber.*

Syngnathus uncinatus Weber: Siboga Exped., vol. 57, Fische, p. 110, fig. 36, 1913 (type loc., Banda). Herre: Pan-Pac. Research Inst., Jour., vol. 8, no. 4, p. 12, Oct.-Dec. 1933 (Madang, New Guinea).

Corythoichthys uncinatus Giltay: Mus. Roy. Hist Nat. Belg., Mem., vol. 5, fasc. 3, p. 49, 1933 (Manokwari, New Guinea).

Specimens 25 to 50 mm long from New Hebrides in the Australian Museum (Whitley).

Corythoichthys flavofasciatus (Rüppell).

Syngnathus intestinalis Ramsay: Linn. Soc. New South Wales, Proc., vol. 5, p. 494, 1881 (no type locality; "The intestinal cavity of Holothuriae").

Corythroichthys intestinalis McCulloch: Zool. Res. Endeavour, vol. 1, pt. 1, p. 26, Dec. 22, 1911 (types came from Bougainville Island in the Solomons).

Duke of York Island; New Britain; Fiji; Malekula and Vila, New Hebrides; Guadalcanar and Bougainville, from latter types of *Syngnathus intestinalis* Ramsay, 100 to 118 mm long, in the Solomons (Whitley).

Corythoichthys conspicillatus (Jenyns).

Corythoichthys conspicillatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 11, Oct.-Dec. 1931 (New Hebrides); vol. 7, no. 1, p. 3, Jan.-Mar. 1932 (Tahiti). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 2, p. 5, Aug. 1932 (Suva).

Pago Pago, Samoa, material in the Australian Museum (Whitley). I have two specimens, 110 to 115 mm long, in Bernice P. Bishop Museum, from off reef Mapiti Island, Mataiea District, Tahiti, November 2, 1929, G. P. Wilder.

Corythoichthys corrugatus Weber.*

Corythoichthys corrugatus Weber: Siboga Exped., vol. 57, Fische, p. 112, fig. 38, 1913 (type loc., Beo, Karakelang). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 11, Oct.-Dec. 1931 (New Hebrides).

Specimens 50 to 63 mm long from New Hebrides in the Australian Museum (Whitley).

Corythoichthys crenulatus (Weber).*

Syngnathus crenulatus Weber: Siboga Exped., vol. 57, Fische, p. 109, fig. 35, 1913 (type loc., Binongka Island).

Corythoichthys crenulatus Giltay: Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 49, 1933 (Manokwari, New Guinea).

Micrognathus brevirostris (Rüppell).

Micrognathus brevirostris Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 5, Oct.-Dec. 1931 (Tulagi, Solomons).

New Hebrides material in the Australian Museum (Whitley).

Micrognathus mataafae (Jordan and Seale).

Malekula, New Hebrides (Whitley).

Micrognathus balli (Fowler).

One, 46 mm, from Kahala, Oahu, January 1930, in Bernice P. Bishop Museum. Interesting as having the brood pouch filled with young nearly ready to be set free. The brood pouch is formed below the first 13 tail rings and the median cleavage line is open for about the first half of its length.

Hippocampus kuda Bleeker.

Southeast coast of New Guinea; Tonga, Friendly Islands; Gizo, Solomon Islands (Whitley).

PEGASIDAE

Parapegasus volitans (Linnaeus).

Pegasus volitans Whitley: Australian Mus., Rec., vol. 15, no. 5, p. 295, Apr. 6, 1927 (Wilanti, South Malaita, Solomons).

New Britain, Bismarck Archipelago, Solomons at Milanti (Whitley).

AULOSTOMIDAE

Aulostomus chinensis (Linnaeus).

Aulostoma valentini Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 3, Jan.-Mar. 1932 (Tahiti).

Hawaiian islands (Whitley).

FISTULARIIDAE

Fistularia petimba Lacépède.

Fistularia petimba Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 5, Oct.-Dec. 1931 (Tulagi, Solomons); vol. 7, no. 1, p. 3, Jan.-Mar. 1932 (Tahiti).—Borodin: Vanderbilt Marine Mus., Bull., vol. 1, art. 3, p. 76, 1932 (Bora Bora, Society Islands).

Hood Bay, New Guinea; Vila Harbor and Malekula, New Hebrides; Funafuti; Pleasant Island; Ocean Island; Hawaiian islands (Whitley).

Fistularia villosa Klunzinger.

Fistularia villosa Herre: Pan-Pac. Research Inst., Jour., vol. 8, no. 4, p. 12, Oct.-Dec. 1933 (Madang, New Guinea).—Giltay: Mus. Roy. Hist. Nat., Mem., vol. 5, fasc. 3, p. 48, 1933 (Manokwari, New Guinea).

CENTRISCIDAE

Centriscus strigatus (Günther).

Aeoliscus strigatus Whitley: Australian Mus., Rec., vol. 15, no. 5, p. 292, Apr. 6, 1927 (Vila Harbor, New Hebrides).

Ontong Java, Lord Howe Group; southeast coast of New Guinea; Bougainville and Howla, Solomons; Vila, New Hebrides (Whitley).

ATHERINIDAE

Atherina temminckii Bleeker.

Atherina temminkii Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, no. 2, p. 49, 1930 (Kusaie, Carolines).

Atherina temmincki Herre: Pan-Pac. Research Inst., Jour., vol. 8, no. 4, p. 12, Oct.-Dec. 1933 (Madang, New Guinea). Giltay: Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 110, 1933 (Mansinam Island and Manokwari, New Guinea).

Vila, New Hebrides; Samoa, as paratypes of *Atherina uisila,* 63 to 75 mm long (Whitley).

Atherina endrachtensis Quoy and Gaimard.

Atherina endrachtensis Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 12, Oct.-Dec. 1931 (New Hebrides), vol. 8, no. 4, p. 12, Oct.-Dec. 1933 (Madang, New Guinea).

Atherina forskalii Rüppell.

Atherina forskalii Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 2, p. 49, 1930 (Ponape, Carolines).

Atherina forskali Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 5, Oct.-Dec. 1931 (Tulagi, Solomons), p. 12 (New Hebrides); vol. 8, no. 4, p. 12, Oct.-Dec. 1933 (Madang, New Guinea). Giltay: Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 111 (Manokwari, New Guinea).

Hepsetia insularum (Jordan and Evermann).

Atherina insularum Borodin: Vanderbilt Marine Mus., Bull., vol. 1, art. 3, p. 76, 1932 (Noumea, New Caledonia; Conway Bay, Indefatigable Island, Galapagos). Ginsburg: B. P. Bishop Mus., Bull. 107, p. 20, 1933 (Pearl and Hermes Reef).

Hepsetia lacunosa (Schneider).

Hepsetia lacunosa Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 12, Oct.-Dec. 1931 (New Hebrides).

Hepsetia pinguis (Lacépède).

Hepsetia pinguis Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 5, Feb. 1932 (Apia; description).

Hepsetia ogilbyi (Whitley).*

Pranasus ogilbyi Whitley: Queensland Mus., Mem., vol. 10, pt. 1, p. 9, Aug. 28, 1930 (type loc., Moreton Bay, Queensland).

Material in the Australian Museum from Vanau Lava, Banks Islands, 100 mm long; 125 to 137 mm long from Tongatabu, Friendly Islands; Vila Harbor, New Hebrides (Whitley).

Melanotaenia rubrostriatus (Ramsay and Ogilby).

Type of *Nematocentrus rubrostriatus* from Strickland River, New Guinea, 63 mm long, in Australian Museum (Whitley).

Rhombosoma goldiei (Macleay).

Types? of *Aristeus goldiei* from Goldie River, New Guinea, in Australian Museum (Whitley).

MUGILIDAE

Mugil dussumieri Valenciennes.

Vaitupu, Ellice Islands, as "fua" mullet (Whitley).

Mugil engeli Bleeker.

Mugil engeli Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 3, Jan.-Mar. 1932 (Tahiti).

Mugil longimanus Günther.

Mugil longimanus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 12, Oct.-Dec. 1931 (New Hebrides).

Mugil trichilus Vaillant and Sauvage.

Mugil trichilus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 6, Feb. 1932 (Apia; note).

Mugil cunnesius Valenciennes.

Mugil cunnesius Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 76, 1932 (Noumea, New Caledonia).

Mugil vaigiensis Quoy and Gaimard.

Liza vaigiensis Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 5, Oct.-Dec. 1931 (Auki, Solomons, in fresh water), p. 12 (New Hebrides); vol. 7, no. 1, p. 3, Jan.-Mar. 1932 (Tahiti).

Mugil vaigiensis Giltay: Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 109, 1933 (Mansinam Island, Manokwari, New Guinea).

Liza melinoptera Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 3, Jan.-Mar. 1932 (Tahiti).

Port Moresby, New Guinea; Vaitupu, Ellice Islands, as "kafakafa" mullet; Teterri, Guadalcanar, Solomons; New Hebrides; Vanikoro (Whitley).

Mugil macrolepis Andrew Smith.

Mugil macrolepis Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 6, Feb. 1932 (Apia); vol. 9, no. 20, p. 5, Aug. 1932 (Suva); no. 29, p. 5, fig. 2, 1932 (Hakahetau Valley, Uapou, Marquesas Islands).

Mugil troscheli Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 12, Oct.-Dec. 1931 (New Hebrides); vol. 7, no. 1, p. 3, Jan.-Mar. 1932 (Tahiti).

Mugil borneensis Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 76, 1932 (Anabo Bay, Nukuhiva Island, Marquesas, in brackish-water creek).

Samoa and fresh water of Normanby Island, from latter as *Mugil compressus* (Whitley).

Mugil oligolepis Bleeker.*

Mugil oligolepsis Bleeker: Naturk. Tyds. Ned. Indie, vol. 16, p. 275, 1858.

Liza oligolepis Herre: Pan-Pac. Research Inst., Jour., vol. 8, no. 4, p. 12, Oct.-Dec. 1933 (Madang, New Guinea).

Mugil seheli Forskål.

Liza seheli Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 3, Jan.-Mar. 1932 (Tahiti).

Samoa, as *Liza caeruleomaculata* (Whitley).

Mugil cephalus Linnaeus.

Mugil cephalus Ginsburg: B. P. Bishop Mus., Bull. 107, p. 20, 1933 (Pearl and Hermes Reef).

Mugil ocur Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 76, 1932 (Papeete, Tahiti, Society Islands).

Mugil carinatus Valenciennes.*

Mugil carinatus Ehrenberg, in Valenciennes: Hist. Nat. Poiss., vol. 11, p. 110, 1836 (type loc., Red Sea; Seychelles; Guam).

Mugil thoburni Jordan and Evermann.*

Mugil thoburni Jordan and Evermann: U. S. Nat. Mus., Bull. 47, pt. 1, p. 812, 1896 (type loc., Galapagos). Fowler: U. S. Nat. Mus., Proc., vol. 80, art. 6, p. 8, 1932 (Eiao, Marquesas Islands; Hivaoa).

Mugil crenilabis Forskål.

Mugil crenilabis Whitley: Australian Mus., Rec., vol. 16, no. 1, p. 11, Oct. 7, 1927 (Santo, New Hebrides).

Material from Santo, New Hebrides; Peu, Vanikoro; Naunaha, Vanikoro lagoon, Santa Cruz Group; types of *Mugil papillosus* from fresh water of Normanby Island, 225 to 323 mm long, in Australian Museum (Whitley).

Mugil labiosus Valenciennes.

Mugil labiosus Giltay: Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 110, 1933 (Mansinam Island, Manokwari, New Guinea).

Myxus leuciscus Günther.

Myxus leuciscus Fowler: U. S. Nat. Mus., Proc., vol. 81, art. 8, p. 3, 1932 (Niuafoou Island).

Funafuti material in the Australian Museum (Whitley).

Myxus elongatus Günther.*

Myxus elongatus Günther: Cat. Fishes Brit. Mus., vol. 3, p. 466, 1861 (type loc., Hobson's Bay; Port Jackson, New South Wales).

Fromanga, New Hebrides (Whitley).

Neomyxus chaptalii (Eydoux and Souleyet).

Neomyxus chaptalii Fowler: U. S. Nat. Mus., Proc., vol. 80, art. 6, p. 8, 1932 (Marquesas Islands; Nahuka; Taiohae); vol. 81, art. 8, p. 3, 1932 (Niuafoou Island).

Chaenomugil chaptali Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 3, Jan.-Mar. 1932 (Tahiti).

Cestraeus plicatilis Valenciennes.

Cestraeus plicatilis Fowler: U. S. Nat. Mus., Proc., vol. 80, art. 6, p. 8, 1932 (Taiohae, Nukuhiva, Marquesas Islands).

Cestraeus goldiei (Macleay).

Types of *Aeschrichthys goldiei* from Goldie River, New Guinea, 188 to 425 mm long in Australian Museum (Whitley).

SPHYRAENIDAE

Sphyraena barracuda (Walbaum).

Sphyraena barracuda Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 5, Aug. 1932 (Suva).

Sphyraena forsteri Cuvier.

Materials from Port Moresby, New Guinea, and New Hebrides, in the Australian Museum (Whitley).

Sphyraena jello Cuvier.

Sphyraena jello Herre: Pan-Pac. Research Inst., Jour., vol. 8, no. 4, p. 12, Oct.-Dec. 1933 (Madang, New Guinea) (typographical error).

The following doubtful form included for reference as it is not certainly reported from Oceania:

Sphyraena leveriana (Shaw).

Gadus leverianus Shaw: Gen. Zool., vol. 4, p. 153, 1803 (type loc., Southern Ocean).

Sphyraena leveriana Whitley: Australian Mus., Rec., vol. 18, no. 4, p. 144, June 29, 1931 (reference).

POLYNEMIDAE

Polydactylus plebeius (Bonnaterre).

Polynemus plebeius Herre: Pan-Pac. Research Inst., Jour., vol 6, no. 4, p. 12, Oct.-Dec. 1931 (New Hebrides).

Polydactylus indicus (Shaw).

Polynemus indicus Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 3, Jan.-Mar. 1932 (Tahiti).

Polydactylus pfeifferi (Bleeker).*

Polynemus pfeifferi Bleeker: Nat. Tijds. Ned. Indie, vol. 4, p. 249, 1853 (type loc., Priaman, Sumatra). Giltay: Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 111, 1933 (Mansinam Island, Manokwari, New Guinea).

Known only from the East Indies.

Eleutheronema tridactylum (Bleeker).*

Polynemus tridactylus Bleeker: Nat. en Geneesk. Arch. Ned. Indië, vol. 2, pt. 3, p. 524, 1845 (type loc., Batavia, Java). Giltay: Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 111, 1933 (Manokwari, New Guinea).

SCOMBRIDAE

Scomber kanagurta Rüppell.

Material from Gizo, Solomons, as *Scomber loo*, in Australian Museum; as *Rastrelliger chrysozonus* from Ontong Java (Whitley).

Rastrelliger brachysoma (Bleeker).

Scomber brachysomus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 5, Aug. 1932 (Suva).

Euthynnus pelamis (Linnaeus).

Euthynnus pelamis Fowler: U. S. Nat. Mus., Proc., vol. 80, art. 6, p. 9, 1932 (off Papeete, Tahiti).

Euthynnus alletteratus (Rafinesque).

Hawaiian examples in the Australian Museum, which look different from so-called "Australian" ones (Whitley).

Thunnus thynnus (Linnaeus).

Thunnus thynnus Fowler: U. S. Nat. Mus., Proc., vol. 80, art. 6, p. 9, 1932 (Obi, Tufa Bay, Eiao; Ua Huka, Marquesas Island).

Thunnus orientalis Schlegel.*

Thynnus orientalis Schlegel: Fauna Japonica, Poiss., pts. 5-6, p. 94, 1844 (type loc., "Mers du Japon").

Thunnus orientalis Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 32, Dec. 1922 (Honolulu). Jordan and Evermann: Cal. Acad. Sci., Occ. Papers, vol. 12, p. 14, Sept. 30, 1926.

Thunnus thynnus (not Linnaeus) Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 133, 1928 (part).

Likely different from *Thunnus thynnus* (Linnaeus), in its slightly lower second dorsal, whose height is less than ½ of pectoral.

Parathunnus sibi (Schlegel).

Change from *Germo sibi* in "Fishes of Oceania".

Neothunnus macropterus (Schlegel).

Change from *Germo macropterus* in "Fishes of Oceania".

Semathunnus guildi Fowler.*

Semathunnus guildi Fowler: Acad. Nat. Sci. Phila., Proc., p. 163, pl. 12, 1933 (type loc., Tahiti, Society Islands).

Semathunnus itosibi (Jordan and Evermann).

Semathunnus itosibi Fowler: Acad. Nat. Sci. Phila., Proc., p. 164, 1933 (reference).

As *Germo albacores* in "Fishes of Oceania". Though admitted doubtfully here, this species should never have been described from an imperfect photograph!

Acanthocybium solandri (Cuvier).

Acanthocybium solandri Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 5, Oct.-Dec. 1931 (Tenibuli, Solomons).

Scomber lanceolatus Banks: Jour. Ed. Hooker, p. 70, 1896 (type loc., "Lagoon Island" = Vahitahi, Tuamotus). ("Obviously refers to the type of *Cybium solandri* Cuvier" —Whitley.)

One from Mutao, Ellice Islands, in the Australian Museum, 940 mm long from end of lower jaw to base of tail (Whitley).

GEMPYLIDAE

Promethichthys prometheus (Cuvier).

One from Ocean Island, Gilbert Group, in the Australian Museum, 530 mm long from lower jaw to base of tail (Whitley).

Ruvettus pretiosus Cocco.

Ruvettus pretiosus Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 3, Jan.-Mar. 1932 (Tahiti).

Materials in Australian Museum from Funafuti Atoll and Niutao, Ellice Group (Whitley).

ISTIOPHORIDAE

Istiophorus brookei Fowler* (fig. 1).

Istiophorus brookei Fowler: Acad. Nat. Sci. Phila., Proc., p. 403, pl. 29, 1933 (type loc., Papeete, Tahiti, Society Islands).

Two examples (fig. 1, *a*, *b*) show about 16 or 17 vertical light lines extending to the upper and lower edges of the body, about 30 dark or black spots on each membrane of the first dorsal fin between the rays, entire fin closely spotted and though spots slightly irregular one row between each fin ray. For comparison is given an example (fig. 1, *c*) perhaps more closely allied, if not identical with, *Istiophorus orientalis* Schlegel, of Japan.

Makaira australis (Whitley)* (fig. 2).

Istiompax australis Whitley: Australian Zoologist, vol. 6, p. 321, 1931 (type loc., off Wollongong, New South Wales); Austral. Mus., Rec., vol. 18, no. 4, p. 148, June 29, 1931 (New South Wales).

The fish illustrated seem to belong to the East Australian-New Zealand species. All have the pectoral longer than the front dorsal lobe, the middle and last dorsal spines short, the ventral shorter than the pectoral and also much shorter with age. Moreover all are uniformly dark gray or neutral above and apparently variably silvery. Their lower surfaces are pale to silvery white.

Tetrapturus mazara Jordan and Snyder.*

Tetrapturus mazara Jordan and Snyder: College Sci. Imp. Univ. Tokyo, Jour., vol. 15, pt. 2, p. 305, May 20, 1901 (type loc., Misaki, Sagami, Japan).

? *Makaira grammatica* Jordan and Evermann: Cal. Acad. Sci., Occ. Papers, vol. 12, p. 55, pl. 16, Sept. 30, 1926 (type loc., Honolulu market; on a photograph).

Tetrapturus mitsukurii (not Jordan and Snyder) Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 136, 1928 (part).

The following two nominal species are likely synonyms of the present:

Tetrapturus illingworthi Jordan and Evermann.*

Tetrapturus illingworthi Jordan and Evermann: Cal. Acad. Sci., Occ. Papers, vol. 12, p. 32, pl. 8, Sept. 30, 1926 (type loc., Honolulu; on dorsal fin and photograph).

? *Tetrapturus kraussi* Jordan and Evermann: Cal. Acad. Sci., Occ. Papers, vol. 12, p. 33, pl. 9 (type loc., Honolulu; on a photograph).

Tetrapturus ectenes Jordan and Evermann.*

Tetrapturus ectenes Jordan and Evermann: Cal. Acad. Sci., Occ. Papers, vol. 12, p. 34, pl. 11, fig. 2, Sept. 30, 1926 (type loc., Honolulu; on a photograph).

A doubtful nominal species, described from an imperfect photograph.

BRAMIDAE

Brama raii (Bloch).

One in the Australian Museum 63 mm long from Eromanga, New Hebrides (Whitley).

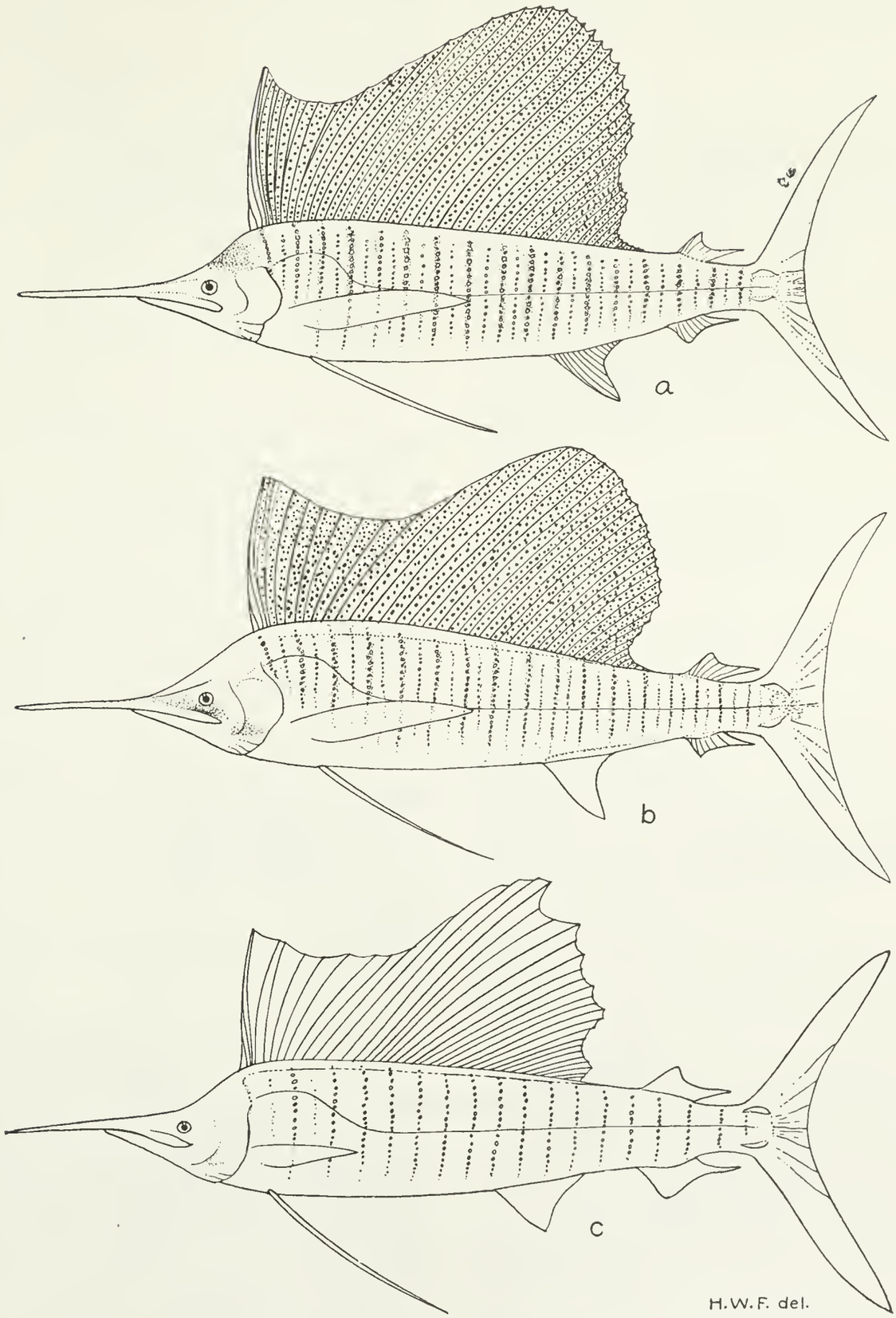

FIGURE 1.—*Istiophorus brookei* Fowler: *a*, type, taken at Papeete, Tahiti, June 6, 1931; *b*, fish from same locality, June 30, 1931; *c*, fish almost 6 feet long and said to have weighed 154 pounds, taken in 1931 at Cocos Island by T. M. Rauch (*a* and *b* from photographs by G. C. Brooke).

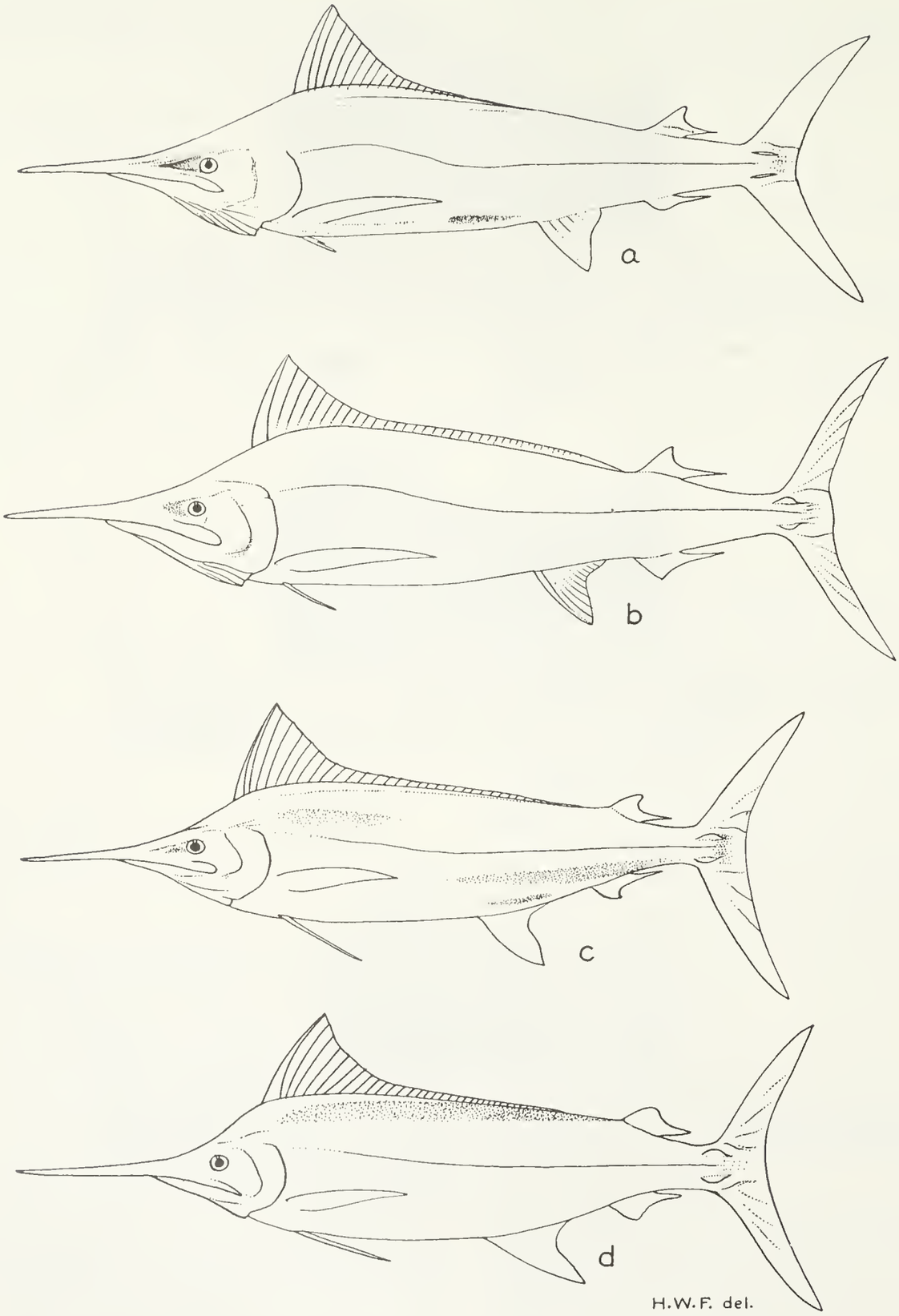

FIGURE 2.—*Makaira australis* (Whitley): *a*, fish weighing 823 pounds, collected February 6, 1932; *b*, collected July 24, 1931; *c*, *d*, smaller fishes with longer ventrals. Obtained at Papeete, Tahiti, by Eastham Guild.

CENTROLOPHIDAE

Cubiceps evermanni (Jordan and Snyder).

Ariomma evermanni Jordan and Snyder: (U. S.) Bur. Fisheries, Bull., vol. 26, p. 209, fig. 1, 1906 (1907) (type loc., Honolulu).

Cubiceps thompsoni Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 378, 1923 (type loc., Honolulu); B. P. Bishop Mus., Mem., vol. 10, p. 138, fig. 32, 1928 (type and paratypes).

Ariomma lurida (not Jordan and Snyder) Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 165, 1928 (part).

Dr. G. S. Myers writes me that *Ariomma evermanni* Jordan and Snyder is a valid species, with *Cubiceps thompsoni* Fowler as a synonym.

CARANGIDAE

Scomberoides lysan (Forskål).

Chorinemus lysan Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 277, fig. 56*b* (teeth), 1931 (Waigiu).

Scomberoides toloo parah (Rüppell).

Scomberoides toloo parah Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 12, 1931 (New Hebrides); vol. 8, no. 4, p. 12, Oct.-Dec. 1933 (Madang, New Guinea).

Chorinemus toloparah Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 77, 1932 (Bora Bora, Society Islands).

Scomberoides sancti-petri (Cuvier).

Scomberoides sancti-petri Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 3, Jan.-Mar. 1932 (Tahiti).

Ontong Java and Funafuti materials in the Australian Museum (Whitley).

Scomberoides orientalis (Schlegel).*

Chorinemus orientalis Schlegel: Fauna Japonica, Poiss., pts. 5-6, p. 106, pl. 57, fig. 1, 1844 (type loc., coasts of Japan). Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 80, 1929 (New Pommern).

Scomberoides orientalis Wakiya: Carnegie Mus., Ann., vol. 15, no. 1, p. 237, pl. 38, fig. 4, July 1, 1924 (Bonin Islands).

Though well described and figured by Wakiya, this species is rejected as doubtful by Weber and Beaufort.

Scomberoides tala (Cuvier).*

Chorinemus tala Cuvier: Hist. Nat. Poiss., vol. 8, p. 277, 1831 (type loc., Malabar).

Scomberoides tala Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 441, 1902 (1903) (Honolulu).

Chorinemus toloo (not Cuvier) Schmeltz: Mus. Godeffroy, Cat. 3, p. 9, 1866 (Samoa); 4, p. 17, 1869 (Samoa). Peters: Akad. Wiss. Berlin, Monatsb., p. 836, 1876 (1877) (Cartaret Harbor, New Ireland). Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 358, 1882 (New Guinea).

Scomberoides toloo Whitley: Pan-Pac. Research Inst., Jour., vol. 3, no. 1, p. 12, Jan.-Mar. 1928 (Santa Cruz Islands).

Scomberoides toloo parah (not Rüppell) Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 140 (part); vol. 11, no. 5, p. 325, 1931 (references).

Scomberoides tol (Cuvier)*

Chorinemus tol Cuvier: Hist. Nat. Poiss., vol. 8, p. 283, 1831 (type loc., Pondicherry: Malabar; Bourou).

Scomberoides tol Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 5, Oct.-Dec. 1931 (Tulagi, Solomons).

Previously known from the Red Sea, East Africa, East Indies, Philippines, Formosa, and Japan.

Seriola dumerili (Risso).

Caranx dumerili Risso: Ichth. Nice, p. 175, pl. 6, fig. 20, 1810 (type loc., Nice).

This name will supersede *Seriola purpurascens* Schlegel as given in "Fishes of Oceania", likewise *Seriola tapeinometopon* Bleeker, which is a synonym according to Weber and Beaufort.

Naucrates ductor (Linnaeus).

Naucrates ductor Pietschmann: B. P. Bishop Mus., Bull. 73, p. 9, 1930 (Pearl and Hermes Reef).

Elagatis bipinnulatus (Quoy and Gaimard).

Elagatis bipinnulatus Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (Tahiti).

Ontong Java materials in Australian Museum (Whitley).

Megalaspis cordyla (Linnaeus).

Megalaspis cordyla Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 12, Oct.-Dec. 1931 (New Hebrides).

Decapterus sanctae-helenae (Cuvier).

Decapterus sanctae-helenae Pietschmann: B. P. Bishop Mus., Bull. 73, p. 9, 1930 (Guam). Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (Tahiti).

New Hebrides, Funafuti, and Hawaiian materials in Australian Museum (Whitley).

Decapterus macrosoma Bleeker.*

Decapterus macrosoma Bleeker: Naturk. Tyds. Ned. Indie, vol. 1, p. 358, 1851 (type loc., Batavia, Java). Wakiya: Carnegie Mus., Ann., vol. 15, no. 1, p. 153, pl. 16, fig. 2, July 1, 1924 (Bonin Islands).

Decapterus lajang Bleeker.*

Decapterus lajang Bleeker: Naturk. Tyds. Ned. Indie, vol. 8, p. 302, 1855 (type loc., Ternate). Wakiya: Carnegie Mus., Ann., vol. 15, no. 1, p. 155, pl. 17, fig. 1, 1924 (Bonin Islands).

Selar boops (Cuvier).

Caranx (Selar) boops Weber and Beaufort: Fishes Indo- Austral. Arch., vol. 6, p. 209, fig. 43, 1931 (Waigiu).

China Straits, New Guinea (Whitley).

Selar crumenophthalmus (Bloch).

Caranx (Selar) crumenophthalmus Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 210, 1931 (Waigiu).

Selar macrophthalmus Wakiya: Carnegie Mus., Ann., vol. 15, no. 1, p. 160, pl. 18, fig. 3, July 1, 1924 (Bonin Islands).

Trachurops macrophthalmus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 12, Oct.-Dec. 1931 (New Hebrides); vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (Tahiti).

Materials in Australian Museum from South West Bay, Malekula, New Hebrides, Samoa, Funafuti, and Hawaiian islands (Whitley).

Trachurus trachurus (Linnaeus).

Selar torvus Wakiya: Carnegie Mus., Ann., vol. 15, no. 1, p. 162, pl. 19, fig. 1, July 1, 1924 (Bonin Islands).

Peu, Vanikoro, and Hawaiian islands (Whitley).

Caranx mate Cuvier.

Caranx (Selar) mate Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 207, 1931 (Waigiu).

Hawaiian materials in the Australian Museum (Whitley).

Caranx kalla Cuvier.

Selar kuhlii Bleeker is placed as a synonym of this species by Weber and Beaufort. The account of *Caranx kuhlii* in "Fishes of Oceania" should therefore be replaced by *Caranx kalla* Cuvier.

Caranx melampygus Cuvier.

Caranx melampygus Cuvier: Hist. Nat. Poiss., vol. 9, p. 87, 1833 (type loc., Waigiu; Rawak, Buru; Vanicolo; Mauritius). E. K. Jordan: U. S. Nat. Mus., Proc., vol. 66, p. 15, 1925 (Honolulu). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 10, Oct.-Dec. 1931 (Moorea, Society Islands). Whitley: Pan-Pac. Research Inst., Jour., vol. 3, no. 1, p. 12, Jan.-Mar. 1928 (Santa Cruz Islands).

Caranx melampygos Schmeltz: Mus. Godeffroy, Cat. 7, p. 45, 1879 (Upolu and Tahiti). Pöhl: Mus. Godeffroy, Cat. 10, p. 31, 1884 (Upolu).

Caranx (Caranx) melampygus Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 248, 1931 (North New Guinea).

Carangus melampygus Streets: U. S. Nat. Mus., Bull. 7, p. 69, 1877 (Honolulu).

Caranx moresbyensis Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 358, 1882 (type loc., New Guinea).

Carangus latus (not Agassiz) Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 444, 1902 (1903) (part).

Caranx lugubris (not Poey) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 321, 1906 (Rarotonga; Shortland; Tahiti; Nukuhiva).

Caranx ascensionis (not Osbeck) Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 145 (not figure) (Oceania materials); vol. 11, no. 5, p. 326, 1931 (part).

Santa Cruz Island and Vaitupu, Ellice Islands, as "Fuaalala", "Tuaulua" (trevally) from latter, in the Australian Museum (Whitley). The above references are deleted from the account in "Fishes of Oceania" of *Caranx ascensionis* (Osbeck). That species may then rest as defined by Günther in 1876 with D. VIII—I, 22; A, II, I, 18 and lateral line 27 to 30. Following Weber and Beaufort both the present species and *Caranx stellatus* Eydoux and Souleyet are admitted, though the last only distinguishable in its spotted coloration. Whitley also notes material from New Guinea in the Australian Museum.

Caranx stellatus Eydoux and Souleyet.*

Caranx stellatus Eydoux and Souleyet: Voy. Bonite, Zool., vol. 1, p. 167, pl. 3, fig. 2, 1841 (type loc., Hawaiian islands). E. K. Jordan, U. S. Nat. Mus., Proc., vol. 66, p. 15, 1925 (Hawaii). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 5, Oct.-Dec. 1931, p. 5 (Hathorne Sound and Tenibuli, Solomons); p. 12 (New Hebrides); vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (Tahiti).

Caranx (Caranx) stellatus Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 253, 1931 (compiled).

Caranx caeruleopinnatus (not Rüppell) Cuvier: Hist. Nat. Poiss., vol. 9, p. 90, 1833 (New Guinea).

Caranx punctatus (not Agassiz) (Quoy and Gaimard) Cuvier: Hist. Nat. Poiss., vol. 9, p. 90, 1833 (name in text).

Caranx melampygus (not Cuvier) Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 133 (not plate), 1876 (part).

Caranx ascensionis (not Osbeck) Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 145 (not figure) (part) 1928.

New Hebrides, Tongatabu, and Samoan materials in Australian Museum (Whitley).

Caranx ignobilis (Forskål).

Caranx ignobilis Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 10, Dec. 1931 (Moorea, Society Islands), p. 12 (New Hebrides). Giltay: Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 59, 1933 (Mansinam Island).

Honolulu materials in Australian Museum (Whitley).

Caranx lugubris Poey.

Caranx ishikawai Wakiya: Carnegie Mus., Ann., vol. 15, no. 1, p. 193, pl. 26, July 1, 1924 (type loc., Bonin Islands; Formosa). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 5, Oct.-Dec. 1931 (Auki, Solomons, in fresh water), p. 12 (New Hebrides); vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (fresh water of Tahiti).

Caranx sexfasciatus Quoy and Gaimard.

Caranx sexfasciatus Wakiya: Carnegie Mus., Ann., vol. 15, no. 1, p. 184, pl. 25, figs. 3-4, July 1, 1924 (Bonin Islands). Fowler: U. S. Nat. Mus., vol. 80, p. 9, 1931 (Hivaoa, Marquesas Islands).

Caranx (Caranx) sexfasciatus Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 243, 1931 (Waigiu).

Carangus elacate Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 177, 1902 (1903) (type loc., Honolulu); vol. 23, pt. 1, p. 190, pl. 31, 1903 (1905) (type).

Caranx elacate Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 147, pl. 13 *A*, 1928 (Honolulu).

?Caranx bixanthopterus Wakiya: Carnegie Mus., Ann., vol. 15, no. 1, p. 190, pl. 27, fig. 2, July 1, 1924 (Bonin Islands).

Port Moresby, New Guinea; Teterri, Guadalcanar, Solomons; Samoa; Ontong Java; Hawaiian islands (Whitley).

Caranx xanthopygus Valenciennes.*

Caranx xanthopygus Valenciennes: Hist. Nat. Poiss. vol. 9, p. 82, 1833 (type loc., Mauritius). E. K. Jordan: U. S. Nat. Mus., Proc., vol. 66, p. 16, 1925 (note).

Caranx carangus (not Bloch) Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 356, 1882 (New Guinea).

Caranx (Caranx) carangus Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 257, 1931 (East Indies).

Carangus rhabdotus Jenkins: U. S. Fish Com., Bull., vol. 22, p. 444, fig. 16, 1902 (1903) (type loc., Honolulu).

Caranx sexfasciatus (not Quoy and Gaimard) Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 149, 1928 (part).

A species known by its more or less naked breast, or with only small median patch of minute scales before the ventrals.

Caranx sansun (Forskål).*

Scomber sansun Forskål: Descr. animalium. pp. xii, 56, 1775 (type loc., Lohaja, Red Sea).

Caranx sansun Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (fresh water of Tahiti). Giltay: Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 59, 1933 (Mansinam near Manokwari, N. G.).

Caranx jarra Wakiya: Carnegie Mus., Ann., vol. 15, no. 1, p. 196, pl. 29, fig. 2, July 1, 1924 (Bonin Islands).

Previously known from the Red Sea, Madagascar, India, Ceylon, Sumatra, Amboina, Formosa, Riu Kiu, and Japan.

Caranx platessa Valenciennes.*

Caranx platessa Valenciennes: Hist. Nat. Poiss., vol. 9, p. 63, 1833 (type loc., "mer des Indes").

Caranx (*Longirostrum*) *platessa* Wakiya: Carnegie Mus., Ann., vol. 15, no. 1, p. 203, July 1, 1924 (Bonin Islands).

Known from Percy, Kermadec, Norfolk Islands, Bass Strait, and Japan.

Caranx leptolepis Cuvier.

Should be included in *Caranx*, rather than in *Gnathanodon*, as in "Fishes of Oceania" and "Supplement 1".

Carangichthys typus Bleeker.

According to Weber and Beaufort this should be suppressed, as it represents a young stage with the preopercle armed with spines, which later disappear.

Gnathanodon speciosus (Forskål).

Gnathanodon speciosus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 12, Oct.-Dec. 1931 (New Hebrides).

Material from Port Moresby, New Guinea (Whitley).

Carangoides gymnostethoides Bleeker.

Carangoides gymnostethoides Pietschmann: B. P. Bishop Mus., Bull. 73, p. 10, 1930 (Pearl and Hermes Reef).

Carangoides gymnostethus Fowler: B. P. Bishop Mus., Mem., vol. 11, no. 5, 1931 (Honolulu) (lapsus).

Though I placed *Caranx novae guineae* Cuvier with *Carangoides ferdau* (Forskål), its small size and brief description do not permit of identification.

Carangoides oblongus (Cuvier).

Caranx oblongus Gray: Descr. Cat. Spec. Roy. College Surg., p. 32, 1859 (Vanicolo).

Carangoides armatus (Forskål).

Caranx armatus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 77, 1932 (Bora Bora, Society Islands).

Carangoides equula (Schlegel).

Caranx equula Schlegel: Fauna Japonica, Poiss., pts. 5-6, p. 111, pl. 60, fig. 1, 1844 (type loc., Nagasaki, Japan).

Carangus cheilio Snyder: U. S. Fish Comm., Bull., vol. 22, p. 524, pl. 8, fig. 14, 1902 (1904) (type loc., Honolulu).

Caranx cheilio Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 146, pl. 12 *C*, 1928 (Honolulu; Laysan); vol. 11, no. 5, p. 326, 1931 (Honolulu). Ginsburg: B. P. Bishop Mus., Bull. 107, p. 20, 1933 (Pearl and Hermes Reef).

Caranx dasson Jordan and Snyder: (U. S.) Bur. Fisheries, Bull., vol. 26, p. 210, fig. 2, 1906 (1907) (type loc., Honolulu). Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 146, 1928 (Honolulu; Johnston Island; French Frigates Shoal).

Known from Natal, Batavia? (by Bleeker), Formosa, Japan, and Hawaii.

Carangoides malabaricus (Schneider).*

Scomber malabaricus Schneider: Syst. Ichth. Bloch, p. 31, 1801 (type loc., Tranquebar).

Caranx (*Carangoides*) *malabaricus* Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 237, fig. 47, 1931 (New Guinea).

Caranx malabaricus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 77, 1932 (Noumea, New Caledonia).

Carangoides dinema Bleeker.

Carangoides dinema Bleeker: Naturk. Tyds. Ned. Indie, vol. 1, p. 365, 1850 (1851) (type loc., Batavia, Java).

Caranx carangoides Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 146, 1928 (compiled).

Ulua mandibularis (Macleay).

New Guinea material in the Australian Museum (Whitley). This species should be placed in a separate genus, *Ulua* Jordan and Snyder 1908, differing from *Carangoides* in its greatly increased lower gill rakers, about 50 in number.

Atropus atropos (Schneider).

Brama atropos Schneider: Syst. Ichth. Bloch, p. 98, pl. 23, 1801 (type loc., Tranquebar).

The reference to *Caranx longipes* Steindachner in "Fishes of Oceania," page 140, had best be placed with this species and admitted to the fauna of Oceania. The genus seems to be valid, characterized chiefly by the presence of a median abdominal groove, in which the ventrals may be depressed and also containing the vent and anal spines.

Blepharis ciliaris (Bloch).

Alectis ciliaris Wakiya: Carnegie Mus., Ann., vol. 15, no. 1, p. 213, pl. 32, fig. 4, July 1, 1924 (Bonin Islands).

Alectis temmincki Wakiya: Carnegie Mus., Ann., vol. 15, no. 1, p. 215, July 1, 1924 (type loc., Bonin Islands; Toasa; Nagasaki).

Alectis breviventralis Wakiya: Carnegie Mus., Ann., vol. 15, no. 1, p. 216, pl. 33, July 1, 1924 (type loc., Riu Kiu; Tokyo Bay; Uwajima Ryukyo; Formosa; Bonin Islands).

Scyris indica Rüppell.

Alectis indicus Wakiya: Carnegie Mus., Ann., vol. 15, no. 1, p. 214, July 1, 1924 (Bonin Islands).

Trachinotus blochii Lacépède.

Cacsiomorus blochii Lacépède: Hist Nat. Poiss., vol. 3, pp. 92, 95, pl. 3, fig. 2, 1802 (no type locality).

Trachynotus ovatus (not Linnaeus) Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 78, 1932 (Apia, Samoa).

According to Weber and Beaufort this name replaces *Trachinotus ovatus* (Linnaeus) as given in "Fishes of Oceania," page 152.

Trachinotus botla (Shaw).

Teterri, Guadalcanar, Solomons (Whitley).

Trachinotus baillonii (Lacépède).

Trachinotus baillonii Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 12, Oct.-Dec. 1931 (New Hebrides).

Trachynotus jordani Wakiya: Carnegie Mus., Ann., vol. 15, no. 1, p. 221, pl. 35, fig. 1, July 1, 1924 (type loc., Bonin Islands).

Malekula, New Hebrides, and Funafuti materials in the Australian Museum (Whitley).

Trachinotus russelii Valenciennes.*

Trachinotus russelii Valenciennes: Hist. Nat. Poiss., vol. 8, p. 320, 1831 (type loc., Pondicherry).

Trachynotus russelei Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 77, 1932 (Noumea, New Caledonia).

RACHYCENTRIDAE

Rachycentron canadum (Linnaeus).

Rachycentron canadus Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 302, fig. 63, 1931 (Vanicolo).

LEIOGNATHIDAE

Leiognathus equula (Forskål).

Leiognathus equula Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 5, Aug. 1932 (Suva).

Materials in the Australian Museum from Titerri, Solomons, and Normanby Island as *Leiognathus edentulus* (Whitley).

Leiognathus smithursti (Ramsay and Ogilby).

Leiognathus smithursti Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 331, 1931 (copied).

Leiognathus fasciatus (Lacépède).

Leiognathus fasciatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 12, Oct.-Dec. 1931 (New Hebrides).

New Hebrides and Samoan materials in the Australian Museum (Whitley).

Gazza minuta (Bloch).

Gazza minuta Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 339, figs. 71-72, 1931 (Waigiu).

Gazza equuliformis Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 78, 1932 (Apia, Samoa).

According to Weber and Beaufort *Gazza equulaeformis* Rüppell, admitted in "Fishes of Oceania," is a synonym. Materials in the Australian Museum from Hood Lagoon, New Guinea, and Guadalcanar, Solomons (Whitley).

KURTIDAE

Kurtus gulliveri Castelnau.

Material from Stickland River, New Guinea, in the Australian Museum (Whitley).

AMIIDAE

Amia poeciloptera (Cuvier).*

Apogon poeciloptera (Kuhl and Van Hasselt) Cuvier: Hist. Nat. Poiss., vol. 2, p. 154, 1826 (type loc., Java). Duncker and Mohr, Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 58, 1931 (Frederick Wilhelm Harbor, New Guinea).

A doubtful species, little known.

Amia nematoptera (Bleeker).

Material in the Australian Museum from New Guinea (Whitley).

Amia orbicularis (Cuvier).

Apogon orbicularis Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 58, 1931 (St. Matthias, Ekaliu; Simpson Harbor, east coast New Pomerania; Frederick Wilhelm Harbor, New Guinea). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Auki, Hathorne Sound and Tenibuli, Solomons).

Materials from Bougainville Island, Solomons (Whitley).

Amia trimaculata (Cuvier).

Apogon trimaculatus McCulloch: Linn. Soc. New South Wales, Proc., vol. 46, pt. 4, p. 168, Nov. 30, 1921 (New Hebrides).

Apogon rhodopterus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Auki, Hathorne Sound, and Tenibuli, Solomons).

Material from Vate, New Hebrides, in the Australian Museum (Whitley).

Amia wichmanni (Weber).

Apogon weberi Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 58, 1931 (Kaiserin Augusta River, New Guinea).

Amia bandanensis (Bleeker).

Apogon bandanensis Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 5, Oct.-Dec. 1931 (Ugii, Solomons), p. 12 (New Hebrides); vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (Tahiti).

Apogon bondanensis Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 79, 1932 (Noumea, New Caledonia) (error).

Materials in the Australian Museum from New Hebrides, Bougainville Island in Solomons, Samoa, and Tongatabu (Whitley).

Amia cyanosoma (Bleeker).*

Apogon cyanosoma Bleeker: Nat. Tyds. Ned Indie, vol. 5, p. 71, 1853 (type loc., Lawajong, Solor Island). Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 58, 1931 (south coast New Pomerania).

Amia hartzfeldii (Bleeker).

Apogon hartzfeldi Herre: Pan-Pac. Resarch Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Auki and Tenibuli, Solomons).

Bougainville Island, Solomons, material in the Australian Museum (Whitley).

Amia fasciata (White).

Apogon fasciatus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 57, 1931 (Dörper Point, South East Bay, New Guinea; Frederick Wilhelm Harbor; St. Matthias, Ekaliu). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 78, 1932 (Suva, Fiji; Noumea, New Caledonia).

Amia novemfasciata Pietschmann: B. P. Bishop Mus., Bull. 73, p. 11, fig. 4 (variation), 1931 (Suva, Fiji).

Apogon novemfasciatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Tenibuli, Solomons), p. 12 (New Hebrides).

Apogon robusta Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 12, Oct.-Dec. 1931 (New Hebrides).

Apogon aroubiensis Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (Tahiti).
Amia aroubiensis Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 6, Aug. 1932 (Suva).

Materials in the Australian Museum from Suva, Fiji; Bougainville Island, Solomons; Tongatabu, Friendly Islands; Vanikoro lagoon, Santa Cruz Group; New Hebrides; Naunaha Island (Whitley).

Amia compressa Radcliffe.

Apogon compressa Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 5, Oct.-Dec. 1931 (Tenibuli, Solomons).

Amia exostigma Jordan and Seale.

Apogon exostigma Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 5, Oct.-Dec. 1931 (Auki and Tenibuli, Solomons); vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (Tahiti).

Materials from Bougainville, Solomons (Whitley).

Amia frenata (Valenciennes).

Apogon frenatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 5, Oct.-Dec. 1931 (Auki and Tenibuli, Solomons), p. 12 (New Hebrides); vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (Tahiti); vol. 8, no. 4, p. 12, Oct.-Dec. 1933 (Madang, New Guinea).
Amia frenata Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 6, Aug. 1932 (Suva).
Apogon snyderi Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 58, 1931 (St. Matthias, Ekaliu).

Australian Museum materials from New Hebrides and Apia, Samoa (Whitley).

Amia amboinensis (Bleeker).

Apogon amboinensis Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 57, 1931 (Dörper Point, South East Bay, New Guinea). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 5, Oct.-Dec. 1931 (Kulambangra, Solomons, in fresh water).

Amia ceramensis (Bleeker).

Material from Vila, New Hebrides, in the Australian Museum (Whitley).

Amia melas (Bleeker).

Apogon melas Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Tenibuli, Solomons).

Amia apogonoides (Bleeker).*

Cheilodipterus apogonoides Bleeker: Soc. Sci. Ind. Neerl., Act., (Manado), vol. 1, p. 37, 1856 (type loc., Manado, Celebes).
Apogon apogonoides Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (Tahiti).

Previously known only from the East Indies.

Amia sangiensis (Bleeker).

Apogon sangiensis Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Auki and Tenibuli, Solomons).

Materials in the Australian Museum from Gizo and Rovana, Solomons (Whitley).

Amia hyalosoma (Bleeker).

Apogon hyalosoma Duncker and Mohr: Naturh. Hamburg, Mitteil., vol. 44, p. 58, 1931 (Thilenius Harbor, south coast New Pomerania). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Tenibuli, Solomons). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 79, 1932 (Noumea, New Caledonia).
Apogon thermalis (not Cuvier) Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 58, 1931 (Dörper Point, South East Bay, New Guinea; Saha, north coast Admiralty Islands).

Material in the Australian Museum from Eromanga, New Hebrides (Whitley).

Amia fleurieu (Lacépède).

Southeast New Guinea (Whitley).

Amia hypselonotus (Bleeker).

Apogon heptacanthus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Tenibuli, Solomons).

New Hebrides material in the Australian Museum (Whitley).

Amia laterale (Valenciennes).

Apogon lateralis Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 57, 1931 (north coast. Kewieng Nusa, New Mecklenburg).
Amia laterale Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 6, Aug. 1932 (Suva).

Amia maculifera (Garrett).

Hawaiian materials in the Australian Museum (Whitley).

Amia cypselura (Weber).*

Rhabdamia cypselurus Weber: Notes Leyden Mus., vol. 39, p. 167, 1909 (type loc., Kawa, West Ceram). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Tenibuli, Solomons).

Previously known only from the East Indies and Philippines.

Amia multitaeniata (Cuvier).*

Apogon multitaeniatus (Ehrenberg) Cuvier: Hist. Nat. Poiss., vol. 2, 1828 (type loc., Red Sea). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 24, p. 6, Oct.-Dec. 1931 (Auki, Solomons).

Previously known from the Red Sea, India, Andamans, East Indies, and Philippines.

Amia kalosoma (Bleeker).*

Apogon kalosoma Bleeker: Nat. Tyds. Ned. Indie, vol. 3, p. 448, 1852 (type loc., Banka or Island Lepar).
Apogon calosoma Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 78, 1932 (Noumea, New Caledonia).

Previously known from India and the East Indies.

Mionorus graeffii (Günther).

Suva, Samoa, and Santa Cruz Islands (Whitley).

Apogonichthys auritus (Valenciennes).

Apogonichthys auritus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 59, 1931 (Hana, Haber, Observation Point Island, north coast New Pome-

rania; Gazelle Peninsula, Blanche Bay, Vulcan Island, west coast).

Material from Vila, New Hebrides, and Samoa in the Australian Museum (Whitley).

Apogonichthys brachygrammus (Jenkins).

Amia (Foa) fo Pietschmann: B. P. Bishop Mus., Bull. 73, p. 10 (east shore Kaneohe Bay, Oahu).

Apogonichthys perdix Bleeker.

Apogonichthys perdix Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (Tahiti).

Apogonichthys polystigma Bleeker.

Apogonichthys polystigma Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 6, Aug. 1932 (Suva).

Archamia lineolata (Cuvier).

Material from southeast New Guinea in Australian Museum (Whitley), also Samoa and Gizo, Solomons.

Archamia buruensis (Bleeker).

Normanby Island in fresh water (Whitley).

Archamia zosterophora (Bleeker).

Apogon zosterophorus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 57, 1931 (Thilenius Harbor, south coast New Pomerania).

Archamia zosterophora Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Tenibuli, Solomons).

Cheilodipterus lineatus (Linnaeus).

Cheilodipterus macrodon Heree: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Tenibuli, Solomons), p. 10 (Moorea, Society Islands).

Cheilodipterus quinquelineatus Cuvier.

Chilodipterus quinquelineatus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 59, 1931 (south coast, New Pomerania).

Cheilodipterus quinquelineatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec., 1931 (Auki and Tenibuli, Solomons); vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (Tahiti).

Samoan and Solomon Islands materials in the Australian Museum (Whitley).

Hynnodus atherinoides Gilbert.

Hynnodus (Scepterias) fragilis Pietschmann: B. P. Bishop Mus., Bull. 73, p. 13, 1930 (Honolulu).

Depth 5; head 3⅛, width 3. Snout 4½ in head from snout tip; eye 2½, greatly exceeds snout or interorbital; maxillary reaches nearly opposite eye center, length 2½ in head from snout tip; interorbital 3 1/5, low, level. Scales most all lost, apparently rather small. D. VI—8; A. I. 7; pectoral 1 2/3 in total head length; ventral 1 4/5. Back leaden gray, paler to silvery white below. Iris whitish. Fins pale or whitish, some gray specks on dorsals and caudal.

One, 30 mm, Laysan Island, Aug. 12, 1930, G. P. Wilder. A very poor young specimen, with badly damaged trunk. Also a second specimen, 35 mm long. Likely due to different action of the preservative this is now pale brown, not gray. With same data as first, also very poorly preserved, in Bernice P. Bishop Museum.

CHANDIDAE

Ambassis safgha (Forskål).

Ambassis commersoni Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 60, 1931 (Möwe Harbor, south coast, New Pomerania, and north coast Massava Harbor; Kelana harbor, New Guinea; Jacquinot Bay, south coast, New Pomerania). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Auki, Solomons). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 79, 1932 (Raiatea, Society Islands).

Materials from Milne Bay, in fresh water, New Guinea (Whitley), also paratypes of *Ambassis vaivasensis* from Samoa. The latter nominal species, admitted in "Fishes of Oceania," should therefore be suppressed as a synonym for the present. It also follows that *Ambassis batjanensis* Bleeker is also another synonym.

Ambassis gymnocephalus (Lacépède).

Ambassis gymnocephalus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 60, 1931 (Massava Harbor, north coast, New Pomerania).

Ambassis miops Günther.

Ambassis miops Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Kulambangra in fresh water, Solomons).

Paratypes of *Ambassis lafa* from Samoa in the Australian Museum (Whitley).

Ambassis interrupta Bleeker.

Ambassis interrupta Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 59, 1931 (Massava Harbor, north coast, New Pomerania).

Material from the Strickland River, New Guinea, in the Australian Museum (Whitley).

Ambassis buroensis Bleeker.*

Ambassis buroensis Bleeker: Nat. Tyds. Ned. Indie, vol. 13, p. 79, 1857 (type loc., Kajeli, Buru).

Priopis buruensis Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Auki, in fresh water, Solomons), p. 12 (New Hebrides).

Previously known from the East Indies and Philippines, the New South Wales form likely different.

Ambassis gigas Ramsay and Ogilby.

Type in the Australian Museum, 110 mm long, from Strickland River, New Guinea (Whitley).

Tetracentrum apogonoides Macleay.

Paratypes in the Australian Museum, 65 to 150 mm long, from the Goldie River in fresh water, New Guinea (Whitley).

DULEIDAE

Dules rupestris (Lacépède).

Kuhlia rupestris Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 60, 1931 (Jacquinot Bay, south coast, New Pomerania; Massava Harbor, Karo River, south coast, New Pomerania; St. Matthias, east coast, Enaie). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Auki, in fresh water, Solomons), p. 12 (fresh water of New Hebrides).

Dules rupestris Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 7, Feb. 1932 (Apia).

In the Australian Museum materials from Samoa, Fiji, New Hebrides, Peu on Vanicoro in Santa Cruz Group from 700 feet above sea level, Normanby Island in fresh water (Whitley), last as *Dules guamensis.*

Dules marginatus (Cuvier).

Kuhlia marginata Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 5, p. 271, fig. 72, 1929 (Waigiu; New Hebrides). Duncker and Mohr: Naturh. Mus., Hamburg, Mitteil., vol. 44, p. 60, 1931 (Jacquinot Bay, south coast, New Pomerania; Möwe Harbor; north coast, Massava Harbor, and Zoller Bay; Langemak Bay, east coast, New Guinea). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Auki, Solomons, in fresh water), p. 10 (Moorea, Soicety Islands, fresh water), p. 12 (New Hebrides, fresh water); vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (Tahiti, fresh water).

Dules marginatus Fowler: U. S. Nat. Mus., Proc., vol. 80, art. 6, p. 9, 1932 (Nukuhiva, Marquesas Islands); vol. 81, art. 8, p. 3, 1932 (Niuafoou Island).

Materials in the Australian Museum from Samoa, Fiji, New Hebrides, Milne Bay, and Cuppa Cuppa in fresh water of New Guinea as *Dules ciliatus,* types of *Dules papuensis* from fresh water of Goldie River 113 to 175 mm long (Whitley).

Dules munda (De Vis).

Kuhlia munda Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 5, p. 274, 1929 (New Caledonia).

Holotype and paratype of *Dules nitens* Ramsay and Ogilby from Port Moresby, New Guinea, 250 to 263 mm long in the Australian Museum (Whitley).

Dules sandvicensis (Steindachner).

Depth 2 3/5 to 2 4/5; head 2 2/3 to 3 1/10, width 1 4/5 to 1 7/8. Snout 3 1/2 to 4 in head from snout tip; eye 2 2/5 to 2 1/2, greatly exceeds snout or interorbital; maxillary reaches 1/10 to 1/4 in eye, expansion 3 1/4 in eye, length 2 2/5 to 3 1/3 in head from snout tip; interoribital 3 1/5 to 3 1/4, level. Gill rakers 10 + 25, lanceolate.

Scales 47 to 48 in lateral line to caudal base and 5 more on latter; 5 above, 12 below, 12 predorsal to occiput, 4 rows on cheek.

D. IX, I, 11, 1, fifth spine 1 1/4 to 1 4/5 in total head length, first branched ray 1 7/8 to 2 1/10; A. III, 11, 1, third spine 2 to 2 1/3, first day 2; caudal 1 to 1 1/8 times head, deeply forked, lobes slenderly pointed; least depth of caudal peduncle 2 2/5 to 2 4/5 in head; pectoral 1 1/2 to 1 2/3; ventral 1 1/2 to 1 2/3.

Back gray, sides and below whitish, everywhere with silvery reflections. Iris pale yellowish white. Vertical fins brownish, grayish terminally and hind caudal edge narrowly dusky to blackish. Paired fins pale to whitish.

Five, 110 to 173 mm. Dropped by a white tern at Laysan Island. G. P. Wilder, Bernice P. Bishop Museum.

Hawaiian materials in the Australian Museum (Whitley).

Dules taeniura Cuvier.

Kuhlia taeniura Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 12, Oct.-Dec. 1931 (New Hebrides); vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (Tahiti).

Dules taeniurus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 7, Feb. 1932 (Apia); U. S. Nat. Mus., Proc., vol. 81, art. 8, p. 4, 1932 (Niuafoou Island).

Dules argenteus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 80, 1932 (Anaho Bay, Nukuhiva, Marquesas Islands).

New Hebrides material in the Australian Museum as *Kuhlia argenteus* (Whitley).

SERRANIDAE

Lates calcarifer (Bloch).

New Guinea material in Australian Museum (Whitley).

Psammoperca waigiensis (Cuvier).

Southeast New Guinea and Gulf of Papua (Whitley).

Plectropomus leopardus (Lacépède).

Port Moresby, New Guinea, material in the Australian Museum (Whitley). *Plectropomus* Oken has been shown to antedate *Paracanthistius* Bleeker as used in "Fishes of Oceania." The species will then stand:

Plectropomus maculatus (Bloch).

Plectropomus oligacanthus (Bleeker).

Plectropomus oligacanthus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Hathorne Sound, Solomons).

Cephalopholis pachycentron (Valenciennes).

Cephalopholis pachycentrum Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 19, 1931 (Waigiu).

Cephalopholis pachycentron Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Tenibuli, Solomons).

Cephalopholis cyanostigma (Valenciennes).*

Serranus cyanostigma (Kuhl and Van Hasselt) Valenciennes: Hist. Nat. Poiss., vol. 2, p. 359, 1828 (type loc., Java).

Cephalopholis cyanostigma Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Tenibuli, Solomons).

Port Moresby, New Guinea, and New Britain materials in the Australian Museum (Whitley). This species previously known from the East Indies and Philippines.

Cephalopholis argus Schneider.

Cephalopholis argus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Tenibuli, Shortland Island, Solomons), p. 12 (New Hebrides); vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (Tahiti). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 6, Aug. 1932 (Suva).

Epinephelus argus Borodin: Vanderbilt Marine Mus., Bull., vol. 1, art. 3, p. 79, 1932 (Raiatea, Society Islands).

Cephalopholis kendalli Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Tenibuli, Solomons).

Materials in the Australian Museum from Samoa, Solomons, Naunha Island at Vanikoro in Santa Cruz Group, Vaitupu Island in Ellice

Group as "Fakamili" (spotted rock cod) (Whitley).

Cephalopholis miniatus (Forskål).

Epinephelus miniatus Weber and Beaufort: Fishes of Indo-Austral. Arch., vol. 6, p. 30, 1931 (Wilhelmsland, New Guinea).

Cephalopholis miniatus Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (Tahiti).

Materials from Gilbert Islands and Port Moresby, New Guinea, in the Australian Museum (Whitley).

Cephalopholis urodelus (Schneider).

Cephalopholis urodelus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Tenibuli, Solomons), p. 12 (New Hebrides). Fowler: U. S. Nat. Mus., Proc., vol. 81, art. 8, p. 4, 1932 (Niuafoou Island).

Materials from Funafuti, Santa Cruz Islands, Malo Passage in New Hebrides, Solomon Islands, Duke of York Island, in the Australian Museum (Whitley).

Cephalopholis leopardus (Lacépède).

Cephalopholis leopardus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Auki, Tenibuli, and Ugi, Solomons).

Epinephelus leopardus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 79, 1932 (Anabo Bay, Nukuhiva, Marquesas Islands).

Funafuti and Vaitupu in Ellice Islands as "Mataele" (spotted rock cod) (Whitley).

Cephalopholis rogaa (Forskål).

Perca rogaa Forskål: Descr. animalium, p. 38, 1775 (type loc., Djedda, Red Sea).

Cephalopholis rogaa Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Tenibuli, Solomons).

Previously known from the Red Sea, Arabia, Zanzibar, Ceylon, East Indies, and Philippines.

Serranus areolatus (Forskål).

Perca summana areolata Forskål: Descr. animalium, pp. xi, 42, 1775 (type loc., Djedda, Red Sea).

Epinephelus areolatus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 79, 1932 (Noumea, New Caledonia).

Serranus angularis Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 79, 1932 (Noumea, New Caledonia).

Serranus stoliczkae Day.*

Serranus stoliczkae Day: Fishes of India, pt. 1, p. 11, pl. 1, fig. 3, 1875 (type loc., coast of Sind; Aden). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 79, 1932 (Noumea, New Caledonia).

Serranus fasciatus (Forskål).

Epinephalus fasciatus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 79, 1932 (Nukuhiva, Marquesas Islands).

Materials in the Australian Museum from Undine Bay, Efati, New Hebrides, in 10 fathoms (Whitley).

Serranus flavo-caeruleus (Lacépède).

Serranus holdtii Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 79, 1932 (Noumea, New Caledonia). (Error.)

New Guinea as *Epinephelus hoedtii* and Port Moresby as *Epinephelus fasciatus* in the Australian Museum (Whitley).

Serranus undulosus (Quoy and Gaimard).

Serranus undulosus Fowler: U. S. Nat. Mus., Proc., vol. 81, art. 8, p. 4, 1932 (Niuafoou Island).

Serranus maculatus (Bloch).

Port Moresby, New Guinea (Whitley).

Serranus sexfasciatus Valenciennes.

Epinephelus sexfasciatus Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 411, 1931 (Digul River, New Guinea).

Serranus chlorocephalus Valenciennes.

Epinephelus chlorocephalus Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 75, 1931 (note).

Serranus bontoides Bleeker.

Epinephelus bontoides Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 51, 1931 (Kaimana, New Guinea).

Serranus daemelii Günther.

Material from Normanby Island in fresh water, in the Australian Museum (Whitley).

Serranus goldiei Macleay.

Epinephelus goldiei Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 73, 1931 (copied; note).

In "Fishes of Oceania" follows the preceding species as a doubtful nominal form and also considered doubtful by Weber and Beaufort.

Serranus magnificus Macleay.

Epinephelus magnificus Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 74, 1931 (copied).

Type of *Epinephelus magnificus* from Port Moresby, New Guinea, 455 mm long, in the Australian Museum (Whitley). A doubtful species, perhaps suggestive of *Serranus septemfasciatus* (Thunberg).

Serranus socialis Günther.

Serranus socialis Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 79, 1932 (Pago Pago, Samoa).

Serranus corallicola Valenciennes.

Serranus corallicola Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 7, Feb. 1932 (Fagamalo and Apia, Samoa).

Serranus howlandi Borodin: Vanderbilt Marine Mus., Bull., vol. 1, art. 3, p. 7, 1932 (Noumea, New Caledonia).

Hood Bay, New Guinea, material in the Australian Museum (Whitley).

Serranus merra (Bloch).

Serranus merra Fowler: U. S. Nat. Mus., Proc., vol. 80, art. 6, p. 9, 1932 (Uahuka, Marquesas Islands); B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 7, Feb. 1932 (Samoa, Apia, Pago Pago); U. S. Nat. Mus., Proc., vol. 81, art. 8, p. 4, 1932 (Niuafoou Island); B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 6, 1932 (Suva).

Epinephelus merra Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 64, 1931 (north coast, Humbolt Bay, Wilhelmsland, New Guinea), p. 412 (Biak, near New Guinea). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Hathorne Sound, Solomons), p. 12 (New Hebrides); vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (Tahiti).

Serranus hexagonatus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 79, 1932 (Apia, Samoa; Suva, Fiji; Noumea, New Caledonia).

Materials in the Australian Museum from Samoa, Friendly Islands, Suva in Fiji (J. S. Callaghan), Solomons, New Hebrides, Ocean Island, Duke of York Island, Ontong Java, New Ireland, Funafuti, Santa Cruz Islands, New Guinea, Vaitupu in Ellice Islands as "Eve" (brown spotted cod) and "Catalaliki" (brown rock cod) (Whitley).

Serranus tauvina (Forskål).

Epinephelus tauvina Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 60, 1931 (Kaimana, New Guinea).

Material from Funafuti in the Australian Museum (Whitley).

Serranus malabaricus (Schneider).*

Holocentrus malabaricus Schneider: Syst. Ichth. Bloch, p. 319, pl. 63, 1801 (type loc., Tranquebar).

Epinephelus merra Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Tenibuli, Solomons).

Previously known from the Red Sea, Zanzibar, Mozambique, Natal, Madagascar, Mauritius, Seychelles, India, Ceylon, Andamans, East Indies, Philippines, China, and Queensland.

Serranus caeruleo-punctatus (Bloch).

Epinephelus caeruleopunctatus McCulloch: Linn. Soc. New South Wales, Proc., vol. 46, pt. 4, p. 468, Nov. 30, 1921 (New Hebrides, New Caledonia, Bougainville Island). Duncker and Mohr: Zool. Mus. Hamburg, Mitteil., vol. 44, p. 57, 1931 (St. Matthias, Ekaliu). Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 412, 1931 (Biack, near New Guinea).

Epinephelus caeruleo-punctatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 Tenibuli, Solomons), p. 12 (New Hebrides).

Materials in the Australian Museum from Vanua Lava in Banks Islands, New Hebrides; Noumea, New Caledonia; Bougainville Island (Whitley).

Serranus summana (Forskål).

Epinephelus ongus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Tenibuli, Solomons); vol. 7, no. 1, p. 4, Mar. 1932 (Tahiti).

Material from Port Moresby, New Guinea, as *Epinephelus polystigma* in the Australian Museum (Whitley).

Serranus fuscoguttatus (Forskål).

Serranus fuscoguttatus Borodin: Vandebilt Mar. Mus., Bull., vol. 1, art. 3, p. 79, 1932 (Apia, Samoa).

Materials in the Australian Museum from reef off Sunday Reef at Efati, Vanikoro; Vaitupu in Ellice Islands as "Fapuku" (spotty-throated rock cod); Engineer Group as *Epinephelus microdon* (Whitley).

Anyperodon leucogrammicus (Valenciennes).

Solomon Islands (Whitley).

Chelidoperca margaritifera Weber.

Chelidoperca margaritifera Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 92, fig. 12, 1931 (type between Misol and New Guinea).

Anthias mortoni Macleay.*

Anthias mortoni Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 107, 1931 (copied).

Although identified with *Anthias margaritaceus* Hilgendorf from Japan in "Fishes of Oceania," Weber and Beaufort admit it as distinct.

Anthias pleurotaenia Bleeker.

Pleasant Island material in the Australian Museum (Whitley).

Herre has given as a nomen nudum *Anthias moorensis* in Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 10, Oct.-Dec. 1931 (type loc., Moorea, Society Islands).

Grammistes sexlineatus (Thunberg).

Grammistes sexlineatus Pietschmann: B. P. Bishop Mus., Bull. 73, p. 14, 1930 (Suva). Duncker and Mohr: Naturh. Mus., Hamburg, Mitteil., vol. 44, p. 57, 1931 (Kelana Harbor, New Guinea). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 12, Oct.-Dec. 1931 (New Hebrides). Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 4, fig. 1, 1931 (Waigiu). Fowler: U. S. Nat. Mus., Proc., vol. 81, art. 8, p. 4, 1932 (Niuafoou Island). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 80, 1932 (Apia, Samoa).

Materials in the Australian Museum from Funafuti, Santo in New Hebrides, Bougainville Island in Solomons, Hood Bay in New Guinea (Whitley).

Plesiops nigricans (Rüppell).

Plesiops nigricans Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 57, 1931 (St. Matthias, Ekaliu). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Tenibuli, Solomons), p. 12 (New Hebrides). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 7, Feb. 1932 (Apia, Samoa; Padang, Sumatra; description).

In the Australian Museum materials from Samoa, Suwarow Island, Vanua, Lava in Banks Islands, New Hebrides (Whitley).

Plesiops melas Bleeker.

Plesiops melas Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 12, Oct.-Dec. 1931 (New Hebrides). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 8, Feb. 1932 (Apia; description).

Samoa and Suva, Fiji (Whitley).

PSEUDOCHROMIDAE

PSEUDOGRAMMINAE

Pseudogramma polyacanthus (Bleeker).

Pseudogramma polyacanthus Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 3, 1931 (Tahiti). Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (Tahiti).

A valid genus, though wrongly placed in *Pseudochromis* in "Fishes of Oceania".

PSEUDOCHROMINAE

Pseudochromis mccullochi (Myers).*

Pseudochromis mccullochi Meyers: Copeia, no. 1, April 12, 1932 (on McCulloch).

Pseudochromis (Pseudochromis) purpurascens (not De Vis) McCulloch: Biol. Res. Endeavour, vol. 5, pt. 4, p. 188, pl. 49, 1926 (Ringdove Bay, Api Island, New Hebrides).

Pseudochromis purpurascens Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 22, 1931 (compiled).

Nesiotes purpurascens Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 13, Oct.-Dec. 1931 (New Hebrides).

Ringdove Bay, New Hebrides, specimen in Australian Museum, type of *Pseudochromis mccullochi* (Whitley).

Pseudochromis tapeinosoma Bleeker.*

Pseudochromis (Leptochromis) tapeinosoma McCulloch; Biol. Res. Endeavour, vol. 5, pt. 4, p. 192, pl. 51, June 8, 1926 (New Hebrides).

New Hebrides material in the Australian Museum (Whitley).

Pseudochromis fuscus Müller and Troschel.

Pseudochromis (Pseudochromis) fuscus McCulloch: Biol. Res. Endeavour, vol. 5, pt. 4, p. 186, June 5, 1926 (New Britain; Solomon Islands).

Pseudochromis fuscus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 70, 1931 (St. Matthias, Ekaliu).

Pseudochromis nebulosus McCulloch: Indian Mus., Mem., vol. 3, p. 49, pl. 16, Jan. 28, 1915 (Duke of York Island; New Britain).

Duke of York Island, Numa Numa on Bougainville Island in British Solomons (Mrs. P. Mildwater) (Whitley).

PRIACANTHIDAE

Priacanthus cruentatus (Lacépède).

Priacanthus cruentatus Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 66, 1931 (Honolulu, Apia, Papeete, Nukuhiva, Hawaiian islands). Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, Jan.-Mar. 1932 (Tahiti).

Priacanthus macracanthus Cuvier.

Priacanthus macracanthus Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 70, 1931 (Honolulu; Hawaiian islands).

Priacanthus hamrur (Forskål).

Priacanthus hamrur Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 74, (Honolulu).

Priacanthus hamrus Ginsburg: B. P. Bishop Mus., Bull. 107, p. 20, 1933 (Pearl and Hermes Reef). (Error.)

It is hard to see by what stretch of the imagination Borodin refers his so-called *Sphenanthias dorianus* to the Priacanthidae! It is undoubtedly the young of some species of *Johnius* and belongs in the Sciaenidae.

Priacanthus longipinnis Borodin.*

Priacanthus longipinnis Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 81, 1929 (type loc., Noumea, New Caledonia).

This species apparently belongs in *Cookeolus*, not only on account of its long ventrals, which are said to be as long as the head, but also as the soft dorsal rays are longer than half the body's depth. Though the body depth is given as 3½, one is not certain whether the caudal may be included. The short pectorals are said to be 2½ in the body depth, as is the case with small specimens of *Priacanthus boops* (Schneider). The fins, except the pectorals, are said to have long filamentous rays. The caudal is described as deeply forked and its lobes prolonged in filaments, longer than head.

Unfortunately the description is unaccompanied by a figure. Its imperfect character and sometimes conflicting statements render it difficult to construe. Altogether it more closely approaches *Priacanthus boops* than any species known to me.

PEMPHERIDAE

Leptobrama mulleri Steindachner.

Leptobrama mülleri Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 64, 1931 (compiled).

Mouth of Aird River, New Guinea (Whitley).

Pempheris mangula Cuvier.

Pempheris mangula Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 55, 1931 (Samoa). Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 71, 1931 (Dörper Point, South East Bay, New Guinea; Lagoon Point, west coast, New Pomerania).

Herre has given the nomen nudum *Pempheris dispar* in Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (type loc., Tenibuli, Solomons).

Pempheris vanicolensis Cuvier.*

Pempheris vanicolensis Cuvier: Hist. Nat. Poiss., vol. 7, p. 227, 1831 (type loc., Vanicolo). Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 58, 1931 (Samoa).

In "Fishes of Oceania" this species is wrongly merged with *Pempheris mangula*. Also the reference to *Pempheris woodlarkensis* Thiollière probably belongs with it.

Pempheris oualensis Cuvier.

Pempheris oualensis Cuvier: Hist. Nat. Poiss., vol. 7, p. 223, 1831 (type loc., Oualan). Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 59, 1931 (Apia).

Pempheris otaitensis Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 81, 1932 (Bora Bora, Society Islands).

This species is listed as *Pempheris otaitensis* Lesson in "Fishes of Oceania", though Cuvier's name has priority.

Hood Bay, New Guinea (Whitley).

LOBOTIDAE

Lobotes surinamensis (Bloch).

Lobotes surinamensis Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 61, 1931 (east of Long Island, New Guinea).

Bougainville Islands in Solomons 43 to 50 mm, New Britain 38 mm, materials in Australian Museum (Whitley).

LUTJANIDAE

Tropidinus zonatus (Valenciennes).

Tropidinus zonatus Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 183, 1931 (Hawaiian islands, Honolulu).

As *Apsilus zonatus* (Valenciennes) in "Fishes of Oceania" and "Supplement 1".

Pristipomoides microdon (Steindachner).

Pristipomoides microdon Fowler: U. S. Nat. Mus. 100, vol. 11, p. 187, 1931 (Honolulu; Hawaiian islands).

Pristipomoides argyrogrammicus (Valenciennes).

Serranus argyrogrammicus Valenciennes: Hist. Nat. Poiss., vol. 8, p. 183, 1831 (type loc., Mauritius).

Pristipomoides argyrogrammicus Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 189, 1931 (compiled).

Anthias multidens Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 80, 1932 (Nouinea, New Caledonia).

Pristipomoides typus Bleeker should be replaced by the above name, therefore the former should be suppressed in "Fishes of Oceania".

Pristipomoides microlepis (Bleeker).

Pristipomoides microlepis Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 190, 1931 (Hawaiian islands).

Pristipomoides filamentosus (Valenciennes).

Serranus filamentosus Valenciennes: Hist. Nat. Poiss., vol. 6, 1830 (St. Denis, Bourbon; Mauritius).

Pristipomoides filamentosus Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 191, 1931 (Hilo).

The above name replaces *Pristipomoides sieboldii* of "Fishes of Oceania" and "Supplement 1".

Hawaiian material in the Australian Museum (Whitley).

Aprion virescens Valenciennes.

Aprion virescens Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 185, 1931 (Hawaiian islands, Honolulu).

Etelis carbunculus Cuvier.

Etelis carbunculus Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 195, 1931 (Hilo; Honolulu; Hawaiian islands).

Etelis marshi (Jenkins).

Etelis marshi Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 194, 1931 (Honolulu; Hawaiian islands).

Aphareus furcatus (Lacépède).

Aphareus furcatus Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 197, 1931 (Fanning Islands; Honolulu; Hawaiian islands).

Aphareus rutilans Cuvier.

In "Fishes of Oceania" the authority for this species is wrongly placed in parenthesis.

Lutjanus kasmira (Forskål).

Lutjanus kasmira Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 157, fig. 14 (variation of color markings), 1931 (Magdalena and Tempe, Marquesas; Tahiti; Apia; Suva).

Lutianus kasmira Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Auki and Tenibuli, Solomons). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 82, 1932 (Raiatea, Society Islands).

Materials from Funafuti, New Hebrides, Solomons, Duke of York Island, New Guinea, in the Australian Museum (Whitley).

Lutjanus spilurus (Bennett).*

Diacope spilura Bennett: Zool. Soc. London, Proc., 1832, p. 182 (type loc., Ceylon Sea).

Lutjanus spilurus Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 153, fig. 13 (variation of color markings), 1931 (Apra Bay, Guam; New Guinea).

This species confused by me with *Lutjanus kasmira* (Forskål) in "Fishes of Oceania", page 195.

Lutjanus johnii (Bloch).

Lutianus johni Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 61, 1931 (St. Matthias, Ekaliu; south coast, Palekau; Linden Harbor, south coast, New Pomerania; Liebliche Island, southwest coast; Dörper Point, South East Bay, New Guinea). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 82, 1932 (Noumea, New Caledonia).

Lutjanus chrysotaenia (Bleeker).

Lutianus chrysotaenia Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Tenibuli, Solomons).

Material from Port Moresby, New Guinea, in the Australian Museum (Whitley).

Lutjanus vitta (Quoy and Gaimard).

Lutianus vitta Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 82, 1932 (Noumea, New Caledonia).

Vanikoro material in the Australian Museum (Whitley).

Lutjanus biguttatus (Valenciennes).

Lutianus biguttatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Hathorne Sound, Solomons).

Materials 88 to 144 mm long in the Australian Museum from Gizo, Solomons (Whitley).

Lutjanus semicinctus Quoy and Gaimard.

Lutjanus semicinctus Fowler: U. S. Nat. Mus., Bull 100, vol. 11, p. 103, 1931 (New Guinea).

Lutianus semicinctus Duncker and Mohr: Naturh. Mus., Hamburg, Mitteil., vol. 44, p. 61, 1931 (St. Matthias, Ekaliu). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Tenibuli and Ugii, Solomons), p. 12 (New Hebrides).

Materials from Ontong Java, Duke of York Island, and Port Moresby, New Guinea, in the Australian Museum (Whitley).

Lutjanus bohar (Forskål).

Lutianus bohar Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Tenibuli, Solomons).

Port Moresby, New Guinea, material in the Australian Museum (Whitley).

Lutjanus fulviflamma (Forskål).

Lutjanus fulviflamma Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 128, 1931 (New Guinea; Suva). Giltay: Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 63, 1933 (Mansinam Island near Manokwari, New Guinea).

Lutianus fulviflamma Duncker and Mohr: Zool. Mus. Hamburg, Mitteil., vol. 44, p. 61, 1931 (Jacquinot Bay and River, south coast, New Pomerania). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Tenibuli, Solomons), p. 12 (New Hebrides).

Lutianus fulviflammus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 82, 1932 (Noumea, New Caledonia).

Lutianus oligolepis Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Tenibuli, Solomons).

Lutianus russelli Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Kulambang Island, Solomons, fresh water).

Materials from Ontong Java, Vanikoro, and Funafuti in the Australian Museum (Whitley).

Lutjanus flavipes (Valenciennes).

Material as "Tangau" (yellow-fin sea perch) from Vaitupu, Ellice Islands, in the Australian Museum (Whitley).

Lutjanus lineatus (Quoy and Gaimard).

Lutianus lineatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Tenibuli, Solomons).

Material from Malekula and Vila, New Hebrides, in the Australian Museum (Whitley).

Lutjanus fulvus (Schneider).

Lutianus fulvus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 82, 1932 (Noumea, New Caledonia).

Lutjanus vaigiensis (Quoy and Gaimard).

Lutjanus vaigiensis Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 115, 1931 (Tahiti; Samoa; Apia); B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 9, Feb. 1932 (Samoa; Apia).

Lutianus marginatus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 61, 1931 (Jacquinot Bay, south coast, New Pomerania). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Kulambangara Island, Solomons, fresh water), p. 10 (Moorea, Society Islands), p. 12 (New Hebrides); vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (Tahiti). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 82, 1932 (Raiatea, Society Islands).

Materials in the Australian Museum from Samoa, Vanikoro, Ontong Java, Solomons, and New Hebrides. Also paratype of *Lutjanus marginipinnis* 181 mm long from fresh water of Normanby Island and type of *Lutjanus rubens* 475 mm long from Port Moresby, besides other material from Hood Bay, New Guinea (Whitley).

Lutjanus gibbus (Forskål).

Lutjanus gibbus Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 168, 1931 (New Guinea; Tahiti; Apiang; Samoa; Tuamotus; Arnho; Tari Tari; Suva).

Lutianus gibbus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 61, 1931 (Jacquinot Bay, south coast, New Pomerania). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Tenibuli, Solomons).

In the Australian Museum materials from Funafuti, Samoa, Solomons?, Hog Harbor in New Hebrides, Port Moresby, and Hood Bay in New Guinea (Whitley).

Lutjanus malabaricus (Schneider).*

Sparus malabaricus Schneider: Syst. Ichth. Bloch, p. 278, 1801 (type loc., Coromandel).

Lutianus malabaricus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Tenibuli, Solomons).

Previously known from India, East Indies, Philippines, China, Formosa, and Japan?.

Lutjanus monostigma (Cuvier).

Lutjanus monostigma Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, 1931, p. 125 (Apia; Tuamotus; Moen); U. S. Nat. Mus., Proc., vol. 80, art. 6, p. 10, 1932 (Ua Huka, Taiohae, Marquesas Islands); B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 6, Aug. 1932 (Suva).

Lutianus monostigma Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 12, Oct.-Dec. 1931 (New Hebrides); vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (Tahiti).

Lutianus lioglossus Herre: Pan-Pac. Research Inst., Jour., vol. 8, no. 4, p. 12, Oct.-Dec. 1933 (Madang, New Guinea).

In the Australian Museum material from Samoa, New Hebrides, Hood Bay in New Guinea, Vaitupu in Ellice Islands as "Taiva" (black spotted sea perch) (Whitley).

Lutjanus rivulatus (Cuvier).

Lutianus rivulatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Tenibuli, Solomons).

Port Moresby and Hood Bay, New Guinea, latter as *Lutjanus parvidens*, materials in the Australian Museum (Whitley).

Lutjanus argentimaculatus (Forskål).

Lutjanus argentimaculatus Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 97, 1931 (Christmas Island; Samoa).

Lutianus argentimaculatus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 61, 1931 (Lukus north coast and Saba west River, Admiralty Islands; Massava Harbor, New Pomerania).

Material in the Australian Museum from Port Moresby, New Guinea, as *Lutjanus gembra* (Whitley).

Macolor niger (Forskål).

Lutianus niger Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Tenibuli, Solomons).

Material in Australian Museum from Admiralty Islands (Whitley). In "Fishes of Oceania" and "Supplement 1" this species is wrongly included in *Lutjanus*.

POMADASYIDAE (=POMADASIDAE)

Caesio cuning (Bloch).

Caesio cuning Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 220, 1931 (New Guinea).

Caesio erythrogaster Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Tenibuli, Solomons).

Vegetichthys tumidus Tanaka is evidently a synonym of this species.

Caesio lunaris Cuvier.

Caesio lunaris Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 65, 1931 (south coast New Pomerania).

Materials from Bougainville Island in Solomons and southeast New Guinea, in the Australian Museum (Whitley).

Caesio caerulaureus Lacépède.

Caesio caerulaureus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 65, 1931 (Möwe Harbor, south coast New Pomerania). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Tenibuli, Solomons).

Material from Santa Cruz Islands in the Australian Museum (Whitley).

Caesio chrysozonus Cuvier.

Caesio chrysozona Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Tenibuli, Solomons).

Pterocaesio tile (Cuvier).

Pterocaesio tile Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 202, 1931 (Mangareva).

In "Fishes of Oceania" this species and the next are wrongly retained in Caesio.

Gymnocaesio argenteus (Bloch).

Gymnocaesio argenteus Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 201, 1931 (compiled).

Plectorhinchus niger (Cuvier).

Pristipoma nigrum (Mertens) Cuvier: Hist. Nat. Poiss., vol. 5, p. 192, 1830 (type loc., Manila).

Plectorhinchus nigrus Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 233, 1931 (Philippines; China; Samoa; Padang); B. P. Bishop Mus., Mem., vol. 11, no. 5, p. 334, 1931 (compiled) (error for *niger*).

Diagramma affine Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 61, 1931 (Dörper Point, South East Bay, New Guinea; St. Matthias, Enaie; Kewieng Nusa, north coast, New Mecklenburg).

China Strait, as type of *Plectorhinchus unicolor* 430 mm long and Hall Sound, New Guinea, materials in the Australian Museum (Whitley). Also some from New Hebrides.

By an oversight this species is wrongly called *Plectorhinchus nigrus* (Cuvier) in "Supplement 1" and *Plectorhinchus crassispinis* (Rüppell) in "Fishes of Oceania", page 205.

Plectorhinchus faetela (Forskål).

Plectorhinchus celebicus Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 205, 1928 (compiled). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Tenibuli, Solomons).

Plectorhinchus polytaenia (Bleeker).

China Strait, New Guinea (Whitley).

Plectorhinchus albovittatus (Rüppell).

Plectorhinchus albovittatus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 6, Aug. 1932 (Suva).

Material from Fiji in the Australian Museum (Whitley).

Plectorhinchus orientalis (Bloch).

Diagramma pica Gray: Cat. Spec. Roy. College Surg., p. 29, 1859 (type loc., Tahiti).

Percoides pica (Parkinson) Gray: Cat. Spec. Roy. College Surg., p. 29, 1859 (name in synonymy).

Material from Admiralty Islands in the Australian Museum (Whitley). *Percoides* (Parkinson) Gray (type *Diagramma pica* Cuvier = *Anthias orientalis* Bloch) is a synonym of *Plectorhinchus*.

Plectorhinchus diagrammus (Linnaeus).

Plectorhinchus diagrammus Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 244, figs. 18-19 (variation of color markings), 1931 (Apia).

Materials from Hood Bay, New Guinea (Whitley).

Plectorhinchus radja (Bleeker).

Hood Bay, New Guinea (Whitley).

Plectorhinchus goldmanni (Bleeker).

Admiralty Islands, Dutch New Guinea, Port Moresby and Hood Bay, New Guinea (Whitley).

Plectorhinchus chaetodonoides Lacépède.

Port Moresby and China Straits, New Guinea (Whitley).

Plectorhinchus pictus (Thunberg).

Diagramma punctatum Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 83, 1932 (Noumea, New Caledonia).

Pomadasys hasta (Bloch).

Pomadasys hasta Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 313, 1931 (New Guinea).

Teterre and Guadalcanar, Solomons materials, 213 to 292 mm long; Port Moresby, New Guinea, specimen wrongly labeled "*Mesoprion goldiei*" in the Australian Museum (Whitley).

Pomadasys opercularis (Playfair).*

Pristipoma operculare Playfair: Fishes of Zanzibar, p. 24, pl. 4, fig. 1, 1866 (type loc., Aden). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 83, 1932 (Noumea, New Caledonia).

Scolopsis margaritifer (Cuvier).

Scolopsis margaritifer Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 277, 1931 (New Guinea). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 277, Oct.-Dec. 1931 (Hathorne Sound, Solomons).

Type of *Scolopsis macrophthalmus* 200 mm long from Port Moresby, New Guinea (Whitley).

Scolopsis cancellatus (Cuvier).

Materials from Vila, New Hebrides, and Bougainville Island, Solomons, former 83 mm long, in the Australian Museum (Whitley).

Scolopsis longulus Richardson.

Scolopsis longulus Richardson: Ann. Mag. Nat. Hist., vol. 9, p. 389, 1842 (type loc., Torres Straits). Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 288, 1931 (New Guinea).

Scolopsis leucotaenia Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 288, Oct.-Dec. 1931 (Hathorne Sound and Tenibuli, Solomons).

Scolopsis trilineatus Kner.

Scolopsis trilineatus Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 290, 1931 (Apia, Samoa).

Samoan material in the Australian Museum (Whitley).

Scolopsis bilineatus (Bloch).

Scolopsis bilineatus Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 292, fig. 24 (young), 1931 (New Guinea). Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 66, 1931 (Möwe Harbor, south coast New Pomerania). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 12, Oct.-Dec. 1931 (New Hebrides). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 6, Aug. 1932 (Suva). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 82, 1932 (Noumea, New Caledonia).

"Solomon Islands"? (Whitley).

Scolopsis ciliatus (Lacépède).

Scolopsis ciliatus Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 300, 1931 (New Guinea). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 6, Oct.-Dec. 1931 (Tenibuli, Solomons).

New Hebrides and Gizo, Solomons (Whitley). Subgenus *Ctenoscolopsis* Fowler 1931 is a synonym of *Lycogenis* Cuvier 1830, which name should therefore supersede it.

Scolopsis temporalis (Cuvier).

Scolopsis temporalis McCulloch: Linn. Soc. New South Wales, Proc., vol. 46, pt. 4, p. 469, Nov. 30, 1921 (Port Moresby, New Guinea; Macleay's specimen).

TERAPONIDAE

Terapon puta Cuvier.

Therapon puta Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 143, 1931 (Waigiu). Herre: Pan-Pac. Research Inst., Jour., vol. 8, no. 4, p. 12, Oct.-Dec. 1933 (Madang, New Guinea).

Terapon jarbua (Forskål).

Terapon jarbua Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 330, figs. 25-26 (variation of color markings), 1931 (Samoa; New Guinea; Lord Howe Island; Apia; Suva); B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 9, Feb. 1932 (Apia; Suva); vol. 9, no. 20, p. 7, Aug. 1932 (Suva).

Therapon jarbua Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 61, fig. 1 (variation), fig. 2 (tail pattern), 1931 (Blanche Bay, Simpson Harbor, north coast, New Pomerania; Rein Bay; south coast, Luschen Harbor; Rein Bay, Plantage-southwest coast, Liebliche Island; New Guinea, east coast Langemak Bay; Saha, north coast Admiralty Islands). Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 147, 1931 (Merauke River, River Siko and Mbai River, New Guinea). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 12, Oct.-Dec. 1931 (New Hebrides).

Samoa, Turtle Bay at Santo in New Hebrides, Suva (J. S. Callaghan) in Fiji, Port Moresby in New Guinea as *Terapon servus*, in the Australian Museum (Whitley).

Terapon theraps Cuvier.

Therapon theraps Duncker and Mohr: Naturh, Mus. Hamburg, Mitteil., vol. 44, p. 64, 1931 (east of Long Island, New Guinea). Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 145, 1931 (Etna Bay and Mimika River, New Guinea).

Terapon kneri Bleeker.

Terapon kneri Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 341, 1931 (Suva).

Terapon micracanthus (Bleeker).

Datnia micracanthus Bleeker: Soc. Ind. Neerl., Act. (Celebes), vol. 8, p. 56, 1860 (type loc., Lagusi, Celebes).

Therapon habbemai Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 155, figs. 28-29, 1931 (Lorentz and Mimika Rivers, New Guinea).

Types of *Terapon trimaculatus*, 92 to 200 mm long, from fresh waters of Goldie River, New Guinea, in the Australian Museum (Whitley).

Terapon cancellatus (Cuvier).

Therapon cancellatus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 64, 1913 (Hauser Bay New Guinea). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 7, Oct.-Dec. 1931 (Auki, Solomons, fresh water).

Types of *Therapon interruptus*, 192 to 250 mm long, from Normanby Island, New Guinea, in the Australian Museum (Whitley).

Terapon argenteus (Cuvier).

Datnia argentea Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 64, 1931 (Jacquinot Bay, south coast New Pomerania; Potsdam Harbor, New Guinea).

In the Australian Museum type of *Therapon nasutus*, 221 to 275 mm long from fresh waters of Normanby Island; type of *Therapon chalybeus*, 106 mm long from Port Moresby, New Guinea; Teterri, Guadalcanar, Solomons; Eromanga and Adyoni River at Santo, New Hebrides (Whitley).

Terapon caudavittatus (Richardson).

Terapon caudavitttatus Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 354, 1931 (compiled).

Therapon caudavittatus Weber and Beaufort: Fishes of Indo-Austral. Arch., vol. 6, p. 154, 1931 (copied).

Material in the Australian Museum from Dutch New Guinea and the Gulf of Papua (Whitley).

Pelates quadrilineatus (Bloch).

Pelates quadrilineatus Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 358, fig. 29 (variation in color markings), 1931 (South Seas).

Australian Museum material from Port Moresby, New Guinea (Whitley).

Pelates romeri (Weber).*

Therapon römeri Weber: Leyden Mus., Notes, vol. 32, pt. 4, p. 233, 1910 (type loc., Lorentz River, New Guinea); Nova Guinea, vol. 9, pt. 4, p. 584, fig. 35, 1913 (Lorentz River at Van Weelskamp, Sabang and Regen Insel).

Pelates römeri Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 163, fig. 31, 1931 (type).

Therapon fuliginosus (not Macleay) Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 212, 1928 (part).

Terapon fuliginosus Fowler: U. S. Nat. Mus., Bull. 100, vol. 11, p. 352, 1931 (part).

Helotes lorentzi Weber.

Helotes lorentzi Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 167, figs. 31-32, 1931 (type; Regen Island, Noord River, Upper Digul River, New Guinea).

LETHRINIDAE

Lethrinus miniatus (Schneider).

Lethrinus miniatus Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (Tahiti). Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 8, fig. 1, 1933 (Tuamotus).

Lethrinus rostratus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 66, 1931 (St. Matthias, Ekaliu). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 82, 1932 (Noumea, New Caledonia).

? Lethrinus rostratus specificus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 82, 1932 (type loc., Bora Bora, Society Islands).

In the Australian Museum materials from Funafuti and Port Moresby, New Guinea (Whitley). *Lethrinus rostratus specificus* Borodin is based on inconsequential characters. For instance, Borodin gives "snout almost 2 in head". I have examined materials ranging with snout 1 3/5 to 3¾ in head. He gives eye 3½ and "large oval eyes, situated far from the tip of the snout". I have materials showing the eye 3 2/5 to 7 2/3 in the head and 1½ to 4¾ in the snout.

Lethrinus amboinensis Bleeker.

Lethrinus amboinensis Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 65, 1931 (Liebliche Island, south west coast New Pomerania).

Australian Museum material from the New Hebrides (Whitley).

Lethrinus hypselopterus Bleeker.

Lethrinus hypselopterus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 7, Oct.-Dec. 1931 (Tenibuli, Solomons).

Lethrinus reticulatus Valenciennes.

Lethrinus reticulatus Fowler: U. S. Nat. Mus., Bull., 100, vol. 12, p. 18, 1933 (Suva, Tonga, Truk).

Lethrinus harak (Forskål).

Lethrinus harak Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 7, Oct.-Dec. 1931 (Tenibuli, Solomons), p. 12 (New Hebrides). Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 21, fig. 2, 1933 (New Guinea, Apia, Kusie, Suva, Vavau).

Material in the Australian Museum from Vaitupu, Ellice Islands, as "Kapatiko" (Emperor) (Whitley).

Lethrinus fraenatus Valenciennes.*

Lethrinus fraenatus Valenciennes: Hist. Nat. Poiss., vol. 6, p. 291, 1830 (type loc., Ceylon). Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 28, 1932 (Apia, Samoa).

? Lethrinus erythracanthus Valenciennes: Hist. Nat. Poiss., vol. 6, p. 314, 1830 (type loc., Luganor, Mariannes).

Lethrinus haematopterus (not Schlegel) Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 216, 1928 (part).

Lethrinus richardsoni Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 291, 1911 (Truk Group; Vavau).

Lethrinus kallopterus Bleeker.

Lethrinus kallopterus Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 30, fig. 3, 1933 (synonymy).

Lethrinus amboinensis (not Bleeker) Jordan and Seale: U. S. Bur. Fisheries, Bull., vol. 25, p. 270, 1905 (1906) (Apia, Samoa). Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 216, 1928 (Apia example).

Lethrinus nebulosus (Forskål).

Lethrinus nebulosus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 83, 1932 (Noumea, New Caledonia). Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 33, fig. 4, 1933 (New Guinea; Vavau).

Lethrinus opercularis Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 215, 1928 (compiled).

Lethrinus mahsenoides (not Valenciennes) Kendall and Goldsborough: B. P. Bishop Mus., Mem., vol. 26, p. 290, 1911 (Vavau, Tonga). Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 213, 1928 (part; on Vavau example).

Lethrinus variegatus Valenciennes.

Lethrinus variegatus Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (Tahiti).

Lethrinus haematopterus Schlegel.

Lethrinus haematopterus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 7, Oct.-Dec. 1931 (Tenibuli, Solomons). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 83, 1932 (Noumea, New Caledonia).

Material from Engineer Group in the Australian Museum (Whitley).

Lethrinus ramak (Forskål).

Lethrinus ramak Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 47, 1933 (Apia; Taritari; New Hebrides).

Materials in the Australian Museum from Funafuti and Vaitupu in Ellice Islands as "Kapatiko" and "Tanutanu" (Emperor) (Whitley).

Lethrinus erythrurus Valenciennes.

Lethrinus erythrurus Valenciennes: Hist. Nat. Poiss., vol. 6, p. 293, 1830 (type loc., Ceylon; young).

Lethrinus ornatus Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 214, 1928 (compiled).

Materials from Port Moresby, New Guinea, in the Australian Museum as *Lethrinus xanthotaenia* (Whitley).

Lethrinus mahsena (Forskål).

Lethrinus mahsena Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 53, 1933 (Apia).

Lethrinus leutjanus (Lacépède).

Lethrinus glyphodon Günther: Cat. Fish. Brit. Mus., vol. 1, p. 462, 1859 (type loc., Louisiades).

Lethrinus cocosensis Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 215, 1928 (compiled).

Materials from Port Moresby, New Guinea, in the Australian Museum (Whitley).

Lethrinus olivaceus Valenciennes.*

Lethrinus olivaceus Valenciennes: Hist. Nat. Poiss., vol. 6, p. 295, 1830 (type loc., Anjer, Sunda Straits, Java). Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 61, 1933 (compiled).

Lethrinus waigiensis Valenciennes: Hist. Nat. Poiss., vol. 6, p. 297, 1830 (type loc., Waigiu; New Guinea).

SPARIDAE

Symphorus spilurus Günther.

Symphorus spilurus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 62, 1931 (Tauwi, Admiralty Islands).

Pentapodus aurolineatus (Lacépède).

Pentapodus aurolineatus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 10, Feb. 1932 (Pago Pago); U. S. Nat. Mus., Bull. 100, vol. 12, p. 76, 1933 (Apia; Mangareva).

Pentapus aurolineatus Fowler: U. S. Nat. Mus., Proc., vol. 81, art. 8, p. 4, 1932 (Niuafoou Island). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 83, 1932 (Pago Pago, Samoa).

? Gnathodentex oculo-maculatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 7, Oct.-Dec. 1931 (Tenibuli, Solomons).

Materials from Solomons, Samoa, Port Moresby, New Guinea, in the Australian Museum (Whitley).

Pentapodus setosus (Valenciennes).*

Pentapodus setosus Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 78, 1933 (on Günther's record).

Pentapus paradiseus Günther: Cat. Fish. Brit. Mus., vol. 1, p. 383, 1859 (type loc., Sumatra; Australia; Moreton Island; Louisiade Archipelago).

Pentapodus caninus (Cuvier).

Pentapus caninus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 7, Oct.-Dec. 1931 (Tenibuli, Solomons).

Pentapodus caninus Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 80, 1933 (New Guinea).

Pentapus pleurostictus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 64, fig. 3, 1931 (type loc., Thilenius Harbor, south coast of New Pomerania).

Snyagris nemurus (Bleeker).

Synagris nemurus Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 90, 1933 (compiled).

Synagris ruber (Valenciennes).

Synagris ruber Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 91, 1933 (compiled).

As *Dentex ruber* Valenciennes in "Fishes of Oceania".

Synagris celebicus (Bleeker).*

Dentex celebicus Bleeker: Nat. Tyds. Ned. Indie, vol. 7, p. 245, 1854 (type loc., Macassar).

Synagris celebicus Günther: Cat. Fish. Brit. Mus., vol. 1, p. 377, 1859 (Louisiades). Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 93, 1933 (compiled).

Synagris furcosus (Valenciennes).

Synagris furcosus Günther: Cat. Fish Brit. Mus., vol. 1, p. 373, 1850 (Amboina; Louisiades; Chaumont Island; Darnley Island; Australia). Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 97, 1933 (Philippines; East Indies).

Nemipterus güntheri Ogilby: Queensland Mus., Mem., vol. 6, p. 58, 1918 (on Günther; thought not of Valenciennes).

Nemipterus robustus Ogilby: Royal Soc. Queensland, Proc., vol. 28, p. 114, 1916 (on Günther; thought not of Valenciennes).

Synagris gracilis (Bleeker).

Synagris gracilis Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 106, 1933 (compiled).

Synagris luteus (Schneider).*

Coryphaena lutea Schneider: Syst. Ichth. Bloch, p. 297, pl. 58, 1801 (type loc., Eastern Sea at Tranquebar).

Synagris luteus Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 112, 1933 (Philippines).

Synagris striatus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, 1932 (Noumea, New Caledonia).

Synagris tolu (Valenciennes).

Synagris tolu Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 114, 1933 (East Indies). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, 1932 (Noumea, New Caledonia).

Monotaxis grandoculis (Forskål).

Monotaxis grandoculis Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 7, Oct.-Dec. 1931 (Tenibuli and Hathorne Sound, Solomons); vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (Tahiti). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 10, Feb. 1932 (Fagamalo, Samoa). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 83, 1932 (Raiatea, Society Islands). Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 134, 1933 (Apra Bay, Guam; Apia; Hawaii; Honolulu; Arhno).

Funafuti and Engineer Group materials in the Australian Museum (Whitley).

Chrysophrys major Schlegel.

Chrysophrys major Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 139, 1933 (Hawaiian specimen).

This species wrongly as *Pagrosomus auratus* (Houttuyn) in "Fishes of Oceania."

Sparus sarba (Forskål).*

Sparus sarba Forskål: Descr. animalium, pp. xi, 31, 1775 (type loc., Djedda, Red Sea). Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 149, 1933 (Portuguese East Africa; Natal; New South Wales; Japan).

Chrysophrys sarba Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 83, 1932 (Noumea, New Caledonia).

Sparus berda Forskål.

Sparus berda Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 7, Oct.-Dec. 1931 (Kulambangra Island, Solomons, in fresh water).

Chrysophrys hasta Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 66, 1931 (Jacquinot Bay, south coast of New Pomerania).

Chrysophrys berda variety *calamara* Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 83, 1832 (Raiatea, Society Islands).

Materials from Gulf of Papua in the Australian Museum (Whitley).

Sparus cuvieri (Day).*

Chrysophrys cuvieri Day: Fishes of India, pt, 1, p. 141, pl. 34, fig. 3, 1875 (type loc., Mangalore). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 83, 1932 (Noumea, New Caledonia).

GIRELLIDAE

Girella nebulosa Kendall and Radcliffe.

Girella nebulosa Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 196, 1933 (type loc., Easter Island).

KYPHOSIDAE

Kyphosus bigibbus Lacépède.

Kyphosus bigibbus Lacépède: Hist. Nat. Poiss., vol. 3, p. 115, pl. 8, fig. 1, 1802 (no type locality). Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 205, 1933 (Hawaiian islands; Oahu; Honolulu; Shortland Island).

Kyphosus sandwicensis Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 2, p. 53, 1930 (Ponape, Carolines).

Kyphosus fuscus Ginsburg: B. P. Bishop Mus., Bull. 107, p. 20, 1933 (Pearl and Hermes Reef).

Hawaiian materials as *Kyphosus fuscus* in the Australian Museum (Whitley).

Kyphosus vaigiensis (Quoy and Gaimard).

Kyphosus vaigiensis Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 209, 1933 (Philippines; East Indies; Madagascar).

Materials in the Australian Museum from Peu on Vanikoro and Engineer Group (Whitley).

Kyphosus cinerascens (Forskål).

Pimelepterus cinerascens Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil. vol. 44, p. 66, 1931 (Pulic Bay, south coast New Pomerania; St. Matthias, Ekaliu). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 84, 1932 (Noumea, New Caledonia).

Kyphosus cinerascens Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 7, Oct.-Dec. 1931 (Tenibuli, Solomons), p. 10 (Moorea, Society Islands). Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 211, 1932 (Apia; Shortland Island, Solomons).

Kyphosus vaigiensis (not Quoy and Gaimard) Jordan and Seale: U. S. Bur. Fisheries, Bull., vol. 25, p. 271, 1905 (1906) (Apia).

Materials in the Australian Museum from Ontong Java, Solomons, New Hebrides, and Port Moresby, New Guinea? (Whitley).

Sectator azureus Jordan and Evermann.

Sectator azureus Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 215, 1932 (type).

GERRIDAE

Gerres setifer (Buchanan-Hamilton).*

Chanda?setifer Buchanan-Hamilton: Fishes of Ganges, pp. 105, 370, 1822 (type loc., Ganges estuaries).

Gerreomorpha setifera Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 255, 1933 (compiled).

Gerres lucidus Cuvier: Hist. Nat. Poiss., vol. 6, p. 359, 1830 (type loc., Pondicherry). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, 84, 1932 (Apia, Samoa). Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 229, fig. 13 (young), 1933 (Ceylon; Siam; India; Singapore).

In my "Analysis of Genera" for the Philippine Gerridae (U. S. Nat. Mus., Bull. 100, vol. 12, p. 226, 1933) the distinctions should read:

b^1 Dorsal spines 9.
  c^1 Preopercle edge entire.....**Gerres**
  c^2 Preopercle edge serrate.....**Diapterus**
b^2 Dorsal spines 10; preopercle edge serrate .....**Gerreomorpha**

Gerreomorpha setigera (Buchanan-Hamilton) (p. 255) should be transferred to replace *Gerres lucidus* Cuvier (p. 229) as *Gerres setifer* (Buchanan-Hamilton).

Gerres kapas Bleeker.

Gerres kapas Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 231, 1933 (Samoa).

Gerres abbreviatus Bleeker.

Gerres abbreviatus Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 232, fig. 14, 1933 (New Guinea).

Material from Hood Lagune, New Guinea, in the Australian Museum (Whitley).

Gerres poieti Cuvier.

In the Australian Museum material from Milne Bay, New Guinea (Whitley).

Gerres oyena (Forskål).

Gerres oyena Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 345, 1931 (Waigiu). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 84, 1932 (Apia, Samoa). Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 236, fig. 16, 1933 (Vavau; Funafuti; Moen; Suva; Truk).

Material in the Australian Museum as *Gerres acinaces* from Vaitupu, Ellice Islands, as "Matu" (Silver Belly) (Whitley).

Gerres macrosoma Bleeker.

Gerres macrosoma Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 65, 1931 (Linden Harbor, south coast New Pomerania). Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 354, 1931 (Waigiu). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 7, Aug. 1932 (Suva).

Australian Museum material from Gizo, Solomons (Whitley).

Gerres oblongus Cuvier.

Gerres oblongus Cuvier: Hist. Nat. Poiss., vol. 6, p. 361, 1830 (type loc., Trinquemale, Ceylon). Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 242, fig. 17, 1933 (Apia, Samoa).

According to Weber and Beaufort the above name supersedes *Gerres gigas* Günther, as used in "Fishes of Oceania."

Gerres ovatus Günther.*

Gerres ovatus Günther: Cat. Fish. Brit. Mus., vol. 1, p. 343, 1859 (type loc., Australia) (figure not published). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 84, 1932 (Noumea, New Caledonia). Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 244, 1933 (New South Wales).

Gerres baconensis (Evermann and Seale).*

Xystaema baconensis Evermann and Seale: U. S. Bur. Fisheries, Bull., vol. 26, p. 69, fig. 8, 1906 (1907) (type loc., Bacon; Jolo, Philippines).

Gerres baconensis Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 245, 1932 (Bonin Islands).

Gerres argyreus (Schneider).

Gerres argyreus Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 246, 1933 (Apia; Funafuti; Bonin Islands; Shortland; Fate).

Materials in the Australian Museum from Ontong Java, Vanikoro, and Vate, New Hebrides (Whitley).

Gerres filamentosus Cuvier.

Gerres filamentosus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 12, Oct.-Dec. 1931 (New Hebrides). Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 248, fig. 18, 1933 (New Guinea).

Gerres punctatus Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 349, fig. 73, 1931 (Waigiu).

Australian Museum material from Port Moresby, New Guinea (Whitley). Weber and Beaufort contend that *Gerres macracanthus* is a distinct species.

MULLIDAE

Mulloidichthys vanicolensis (Valenciennes).

Mulloidichthys vanicolensis Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 262, 1933 (New Guinea; Johnston Island).

Mulloidichthys auriflamma (Forskål).

Mulloidichthys auriflamma Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 376, 1932 (New Guinea). Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 263, 1933 (Apia; Bonin Islands; Honolulu; Borabora; Makemo; Funafuti; Vavau; Guam).

Mulloides flavolineatus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 66, 1931 (Jacquinot Bay, south coast New Pomerania; Dörper Point, Jacquinot Bay, and South East Bay, New Guinea).

Materials in the Australian Museum from Funafuti, New Hebrides, Ugi in Solomons, Hood Bay, and southeast New Guinea (Whitley).

Mulloidichthys erythrinus (Klunzinger).

Mulloidichthys erythrinus Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 266, 1933 (compiled).

Mulloidichthys samoensis (Günther).

Mulloides samoensis Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 7, Oct.-Dec. 1931 (Tenibuli, Solomons); vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (Tahiti).

Mulloidichthys samoensis Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 10, Feb. 1932 (Fagamalo, Samoa). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 84, 1932 (Anaho Bay, Nukuhiva, Marquesas). Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 266, 1933 (Apra Bay, Guam; Midway Islands; Bonin Islands; Fannings; Johnston Island; New Guinea; Apia; Hawaiian islands; Hilo; Makemo; Funafuti).

Australian Museum materials from New Hebrides, Samoa, Pleasant Island, Santa Cruz Island, Funafuti, Gilberts, Solomons, New Guinea, German New Guinea, Vaitupu in Ellice Islands as "Kaivete" and "Kalo" (yellow-striped goatfish) (Whitley).

Mulloidichthys pflugeri (Steindachner).*

Mulloidichthys pflugeri Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 270, 1933 (Hawaiian islands).

Mulloides flammeus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 2, p. 53, 1930 (Hilo).

Mulloides samoensis (not Günther) Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 234, 1928 (part).

Australian Museum material from the Hawaiian islands (Whitley).

Pseudupeneus pleurostigma (Bennett).

Pseudupeneus pleurostigma Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 275, 1933 (Midway islands; Hawaiian islands; Honolulu).

Hawaiian material in the Australian Museum (Whitley).

Pseudupeneus barberinoides (Bleeker).

Pseudupeneus barberinoides Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 276, fig. 20, 1933 (Vavau).

Australian Museum material from Engineer Group, Hood Bay, Dutch New Guinea, and southeast New Guinea (Whitley).

Pseudupeneus atrocingulatus (Steindachner).*

Upeneus atrocingulatus (Kner) Steindachner: Akad. Wiss. Wien, Sitzb., vol. 61, p. 443, 1870, (type loc., Savay).

Upeneus trifasciatus variety *atrocingulatus* Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 59, pl. 44, *C*, 1874. Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 385, 1931 (copied).

Upeneus trifasciatus (not Lacépède) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 72, 1901 (Agana, Guam). Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 227, 1928 (part).

Upeneus multifasciatus (not Quoy and Gaimard) Fowler: B. P. Bishop Mus., vol. 10, p. 228, 1928 (part).

Pseudupeneus barberinodes (not Bleeker) Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 276, 1933 (on Steindachner).

Pseudupeneus macronemus (Lacépède).

Upeneus macronema Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 84, 1932 (Raiatea, Society Islands).

Pseudupeneus macronemus Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 279, 1933 (Honolulu).

Pseudupeneus spilurus (Bleeker).

Parupeneus spilurus Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 397, 1931 (compiled).

Pseudupeneus spilurus Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 280, 1933 (Philippines; Japan).

Pseudupeneus barberinus (Lacépède).

Upeneus barberinus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 66, 1931 (St. Matthias, Ekaliu). Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (Tahiti).

Upeneus barbarinus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 7, Oct.-Dec. 1931 (Hathorne Sound, Solomons) (error).

Parupeneus barberinus Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 392, fig. 77, 1931 (New Guinea). Giltay: Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 65, 1933 (Manokwari, New Guinea).

Pseudupeneus barberinus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 7, Aug. 1932 (Suva); U. S. Nat. Mus., Bull. 100, vol. 12, p. 283, fig. 21, 1933 (New Guinea; Apia; Fakarava; Moen; Truk).

Australian Museum material from Solomons and Vaitupu in Ellice Islands, as "Tuta" (goatfish) (Whitley).

Pseudupeneus indicus (Shaw).

Parupeneus indicus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 84, 1932 (Apia, Samoa).

Pseudupeneus indicus Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 287, fig. 22, 1933 (New Guinea; Apia, Samoa).

Upeneus malabaricus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 66, 1931 (Dörper Point, South East Bay, New Guinea).

Parupeneus malabaricus Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 395, 1931 (compiled).

Australian Museum materials from Peu, Vanikoro, and New Guinea (Whitley).

Pseudupeneus bifasciatus (Lacépède).

Upeneus bifasciatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 10, Oct.-Dec. 1931 (Moorea, Society Islands); vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (Tahiti).

Pseudupeneus bifasciatus Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 291, 1933 (Samoa; Apia; Papeete; Honolulu).

Material in the Australian Museum from southeast New Guinea (Whitley).

Pseudupeneus semifasciatus (Macleay).*

Upeneus semifasciatus Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 263, 1883 (type loc., Hood Bay, New Guinea).

Upeneus bifasciatus (not Lacépède) Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 227, 1928 (part: on Macleay).

Pseudupeneus bifasciatus Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 291, 1933 (on Macleay).

This species admitted in deference to Whitley's examination of the type, a specimen 244 mm long from Hood Bay?, in the Australian Museum.

Pseudupeneus orientalis Fowler.*

Pseudupeneus orientalis Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 294, fig. 23, 1933 (type loc., Cook's Bay, Easter Island).

Pseudupeneus multifasciatus (not Quoy and Gaimard) Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 35, p. 122, 1911 (1912) (type).

Upeneus multifasciatus Fowler: B. P. Bishop Mus., Mem., vol. 19, p. 228, 1928 (type).

Pseudupeneus trifasciatus (Lacépède).

Upeneus multifasciatus Pietschmann: B. P. Bishop Mus., Bull. 73, p. 14, 1930 (Guam).

Parupeneus trifasciatus Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 382, fig. 78 (head), 1931 (Arso River, north New Guinea).

Pseudupeneus trifasciatus Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 295, fig. 24, 1933 (Bonin Islands; Tahiti; Apia; Kusaie).

Upeneus moana Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 7, Oct.-Dec. 1931 (Tenibuli, Solomons), p. 10 (Moorea, Society Islands), p. 12 (New Hebrides); vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (Tahiti).

Australian Museum materials from Funafuti, Port Moresby, and southeast New Guinea (Whitley).

The references under this species in "Supplement 1," page 336, as "*Upeneus moana* (not Quoy and Gaimard) Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 228, 1928 (part)" is wrong and should be suppressed.

Pseudupeneus multifasciatus (Quoy and Gaimard).

Pseudupeneus multifasciatus Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 300, 1933 (Honolulu; Johnston Island; Hawaiian islands; "Tahiti").

Honolulu material in the Australian Museum (Whitley).

Pseudupeneus fraterculus (Valenciennes).

Pseudupeneus fraterculus Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 302, fig. 25, 1933 (Tahiti).

Upeneus pleuraspilos (not Bleeker) Fowler: Acad. Nat. Sci. Phila., Proc., p. 520, 1900 (Tahiti); B. P. Bishop Mus., Bull. 20, p. 37, 1925 (Tahiti example).

Upeneus luteus (not Valenciennes) Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 231, 1928 (Tahiti example).

Pseudupeneus cyclostomus (Lacépède).

Mullus cyclostomus Lacépède: Hist. Nat. Poiss., vol. 3, pp. 383, 404, pl. 14, fig. 3, 1802 (no locality).

Pseudupeneus cyclostomus Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 304, 1933 (Bonin Islands; Tahiti; Marquesas; Apia; Samoa; Hawaiian islands; Honolulu; Pacific Ocean).

Parupeneus chrysorydris (not Lacépède) Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 84, 1932 (Papeete, Tahiti, Society Islands) (error).

Pseudupeneus filamentosus (Macleay).*

Upeneus filamentosus Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 264, 1883 (type loc., Hood Bay, New Guinea).

Pseudupeneus (Hogbina) filamentosus Whitley: Linn. Soc. New South Wales, Proc., vol. 54, pt. 2, p. 93, pl. 3, 1929 (Macleay's type; southeast New Guinea; Ontong Java; Melanesia).

Upeneus chrysorydros (not Lacépède) Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 232, 1928 (part; on Macleay).

Pseudupeneus cyclostomus (part) Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 304, 1933 (on Macleay and Whitley).

Australian Museum material from Hawaiian islands, Ontong Java, southeast New Guinea, and Hood Bay (Whitley).

Pseudupeneus porphyreus Jenkins.

Pseudupeneus porphyreus Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 310, fig. 26, 1933 (Honolulu; Kailua; Hawaiian islands).

This and most other species here listed wrongly placed in *Upeneus* in "Fishes of Oceania."

Pseudupeneus chrysonemus Jordan and Evermann.

Pseudupeneus chrysonemus Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 312, 1933 (Hilo; Hawaiian islands; Honolulu).

Upeneus taeniatus (not Kner) Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 229, 1928 (type of *Pseudupeneus chrysonemus*; Hilo; Honolulu).

Pseudupeneus bilineatus (Valenciennes).

Pseudupeneus bilineatus Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 313, 1933 (Palmyra specimen).

Pseudupeneus luteus (Valenciennes).

Pseudupeneus luteus Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 313, 1933 (compiled).

Pseudupeneus cinnabarinus (Cuvier).*

Upeneus cinnabarinus Cuvier: Hist. Nat. Poiss., vol. 3, p. 475, 1829 (type loc., Trinquemale, Ceylon).

Pseudupeneus cinnabarinus Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 314, 1933 (compiled).
Upeneus cinnaborinus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, 1932 (Raiatea, Society Islands; Noumea, New Caledonia) (error).
Upeneus cinnaborinus grandoculis Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 84, 1932 (type loc., Bora Bora, Society Islands) (error).

Borodin distinguishes his *Upeneus cinnaborinus grandoculis* chiefly by the very large eyes, which he gives as 3½.

Pseudupeneus crassilabris (Valenciennes).
Pseudupeneus crassilabris Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 315, 1933 (Johnston Island).

Pseudupeneus taeniatus (Kner).
Pseudupeneus taeniatus Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 317, 1933 (compiled).

Pseudupeneus jansenii (Bleeker).
Pseudupeneus jansenii Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 317, 1933 (Philippines).
Parupeneus janseni Giltay: Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 65, 1933 (Mansinam Island, near Manokwari, New Guinea).

Upeneus bensasi (Schlegel).*
Mullus bensasi Schlegel: Fauna Japonica, Poiss., pts. 2-3, p. 30, pl. 1, fig. 2, 1843 (type loc., Bay of Nagasaki).
Upenoides bensasi Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 84, 1932 (Venus Point Reef, Tahiti, Society Islands).
Upeneus bensasi Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 321, fig. 27 (young), 1933 (Philippines; China; Japan; Riu Kiu; Formosa).

Upeneus taeniopterus Cuvier.
Upeneus taeniopterus Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 327 (compiled).

Upeneus sulphureus Cuvier.
Upeneoides sulfureus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 66, 1931 (Rein Bay, north coast New Pomerania).
Upeneus sulphureus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 12, Oct.-Dec. 1931 (New Hebrides). Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 330, fig. 301, 1932 (Suva).

Upeneus vittatus (Forskål).
Upeneus vittatus Fowler: U. S. Nat. Mus., Proc., vol. 80, art. 6, p. 10, 1931 (Hivaoa; Atuona Bay, Hivaoa, Marquesas); B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 7, Aug. 1932 (Suva). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 84, 1932 (Bora Bora, Society Islands). Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 334, fig. 31, 1933 (Suva; Tahiti).

Australian Museum materials from Fiji, New Hebrides, Ugi, Teterri, and Guadalcanar in the Solomons (Whitley).

Upeneus arge Jordan and Evermann.
Upeneus arge Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art 2, p. 53, 1930 (Hilo). Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 338, 1933 (Honolulu; Hawaiian islands).

Upeneus tragula Richardson.
Upeneus tragula Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 368, fig. 75, 1931 (New Guinea).
Upeneoides tragula Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 7, Oct.-Dec. 1931 (Tulagi, Solomons).
? *Pseudupeneus jeffi* Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 281, 1933 (copied).

Australian Museum material from Admiralty Islands and Port Moresby, New Guinea (Whitley).

EMMELICHTHYIDAE

Erythrocles schlegeli (Richardson).
Erythrocles schlegeli Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 348, 1933 (Hawaiian islands; Honolulu).

SCIAENIDAE

Johnius axillaris (Cuvier).
Corvina axillaris Cuvier: Hist. Nat. Mus., vol. 5, p. 111, 1830 (type loc., Malabar).
Johnius axillaris Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 397, 1933 (Philippines).
Johnius papuensis Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 235, 1928 (on Hase).

SILLAGINIDAE

Sillago sihama (Forskål).
Sillago sihama Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 70, 1931 (Rein Bay, north coast New Pomerania). Borodin: Vanderbilt Mar. Mus., vol. 1, art. 3, p. 85, 1932 (Noumea, New Caledonia). Fowler: U. S. Nat. Mus., Bull. 100, vol. 12, p. 417, 1933 (New Guinea).

Australian Museum material from New Guinea (Whitley).

Sillago macrolepis Bleeker.
Sillago macrolepis Weber and Beaufort: Fishes Indo-Austral. Arch., vol. 6, p. 171, 1932 (Saonek, Waigiu).

In "Fishes of Oceania" the authority for this species should stand as above.

Nandus nandus (Buchanan-Hamilton), listed by Borodin as *Nandus marmoratus* (Vanderbilt Mar. Mus., Bull., vol. 1, art. 2, p. 54, 1930) from Pearl Harbor, Oahu, is doubtless either erroneous or an introduction. For the present the Nandidae may be excluded from the Hawaiian fish fauna.

MALACANTHIDAE

Malacanthus latovittatus (Lacépède).

Material in the Australian Museum from Ontong Java, New Britain, Port Moresby in New Guinea, and the Hawaiian islands (Whitley).

CIRRHITIDAE

Cirrhitoidea bimacula Jenkins.
Oxycirrhites (Cirrhitoidea) bimacula Pietschmann: B. P. Bishop Mus., Bull. 73, p. 15, 1930 (Pearl and Hermes Reef).

Cirrhitus pinnulatus (Schneider).
Cirrhitus pinnulatus Fowler: U. S. Nat. Mus., Proc., vol. 81, art. 8, p. 5, 1932 (Niuafoou Island).
Cirrhitus marmoratus Pietschmann: B. P. Bishop Mus. Bull. 73, p. 15, 1930 (Pearl and Hermes Reef).
Cirrhitichthys marmoratus Borodin: Vanderbilt Mar.

Mus., Bull., vol. 1, art. 3, p. 85, 1932 (Poonaruma Reef, Tahiti, Society Islands).

Cirrhites marmoratus Ginsburg: B. P. Bishop Mus., Bull. 107, p. 20, 1933 (Pearl and Hermes Reef).

Australian Museum materials from Mallicola, Funafuti, Pleasant Island, Aneiteum in New Hebrides, Hawaiian islands, Vaitupu in Ellice Islands as "patuki" (kelp fish) (Whitley).

Cirrhitus oxycephalus Bleeker.

Cirrhitichthys oxycephalus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 69, 1931 (Frederick Wilhelm Harbor, New Guinea).

Paracirrhites forsteri (Schneider).

Cirrhitus forsteri Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 85, 1932 (Suva, Vitilevu, Fiji).

Materials from Duke of York Island and Hawaiian islands in the Australian Museum (Whitley).

Paracirrhites arcatus (Cuvier).

Paracirrhites arcatus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 2, p. 55, 1930 (Oahu).

Materials from Dauco Island, Port Moresby, southeast coast of New Guinea, and Hawaiian islands in the Australian Museum (Whitley).

Paracirrhites cinctus (Günther).

Paracirrhites cinctus Pietschmann: B. P. Bishop Mus., Bull. 73, p. 15, 1930 (Honolulu).

Hawaiian material in the Australian Museum (Whitley).

MONODACTYLIDAE

Monodactylus argenteus (Linnaeus).

Materials from Samoa and Suwarow Island in the Australian Museum (Whitley).

PLATACIDAE

Platax pinnatus (Linnaeus).

Australian Museum materials from Solomons, New Hebrides, and Port Moresby (Whitley).

EPHIPPIDAE

Drepane punctatus (Linnaeus).

Australian Museum materials from Port Moresby (Whitley).

TOXOTIDAE

Toxotes jaculator (Pallas).

Materials from Teterri, Guadalcanar, Solomons, and Port Moresby, New Guinea, in the Australian Museum (Whitley).

The species *Toxotes squamosus* Hutton, from New Zealand, has been identified with *Brama raii*.

SCATOPHAGIDAE

Scatophagus argus (Linnaeus).

Scatophagus argus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 12, Oct.-Dec. 1931 (fresh waters of New Hebrides). Giltay: Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 69, 1933 (Lobo, Triton Bay, New Guinea).

Material from Port Moresby, New Guinea, in the Australian Museum (Whitley).

Scatophagus tetracanthus (Lacépède).

Scatophagus multifasciatus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 86, 1932 (Noumea, New Caledonia).

Port Moresby materials in the Australian Museum (Whitley).

CHAETODONTIDAE

Forcipiger longirostris (Broussonet).

Forcipiger longirostris Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 10, 1931 (Moorea, Society Islands).

Materials from Bougainville, Solomon Islands, and Hawaiian islands, in the Australian Museum (Whitley).

Chaetodon ornatissimus Cuvier.

Chaetodon ornatissimus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 86, 1932 (Society Islands).

Australian materials from Solomons, Samoa, Admiralty Islands and, southeast New Guinea (Whitley).

Chaetodon pelewensis Kner.

Material from Pago Pago, Samoa, in the Australian Museum (Whitley).

Chaetodon bennetti Cuvier.

Chaetodon bennetti Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 7, Oct.-Dec. 1931 (Hathorn Sound, Solomons).

New Britain, Solomons, and Admiralty Islands materials in the Australain Museum (Whitley).

Chaetodon fremblii Bennett.

Chaetodon fremblii Ginsburg: B. P. Bishop Mus., Bull. 107, p. 20, 1933 (Pearl and Hermes Reef).

Chaetodon speculum Cuvier.

Port Moresby material in the Australian Museum (Whitley).

Chaetodon trifasciatus Mungo Park.

Chaetodon trifasciatus Gray: Descr. Cat. Spec. Roy. College Surg., p. 36, 1859 (South Seas). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 2, p. 55, 1930 (Oahu). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 7, 1931 (Tenibuli and Ugi, Solomons); p. 10 (Moorea, Society Islands); p. 12 (New Hebrides); vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (Tahiti). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 8, p. 10, Feb. 1932 (Fagamalo, Samoa). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 86, 1932 (Raiatea, Society Islands; Noumea, New Caledonia).

Australian Museum materials from Samoa, New Hebrides, Friendly Islands, Admiralty Islands, New Britain, Fiji, Bougainville Island and Howla, Solomons, German New Guinea, and Port Moresby (Whitley).

Chaetodon ephippium Cuvier.

Chaetodon ephippium Duncker and Mohr: Naturh.

Mus. Hamburg, Mitteil., vol. 44, p. 72, 1931 (Liebliche Island, southwest coast New Pomerania, St. Matthias, Ekaliu).

Australian Museum materials from Samoa, Vaitupu in Ellice Islands as "manipapa" (butterfly fish), Bougainville, Solomons, German New Guinea, and Port Moresby (Whitley).

Chaetodon octofasciatus Bloch.

Chaetodon octofasciatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 7, Oct.-Dec. 1931 (Tenibuli, Solomons).

Solomons and Admiralty Islands material in the Australian Museum (Whitley).

Chaetodon flavirostris Günther.

Chaetodon flavirostris Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 86, 1932 (Noumea, New Caledonia).

Chaetodon miliaris Quoy and Gaimard.

Chaetodon miliaris Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 2, p. 55, 1930 (Honolulu). Ginsburg: B. P. Bishop Mus., Bull. 107, p. 20, 1933 (Pearl and Hermes Reef).

Chaetodon citrinellus Cuvier.

Chaetodon citrinellus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 10, Oct.-Dec. 1931 (Moorea, Society Islands); vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (Tahiti). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 10, Feb. 1932 (Fagamalo and Pago Pago, Samoa).

In the Australian Museum materials from Samoa, Solomons, Friendly Islands, Santo in New Hebrides, and Port Moresby, New Guinea (Whitley).

Chaetodon punctato-fasciatus Cuvier.

Australian Museum materials from Admiralty Islands and Solomons (Whitley).

Chaetodon lunula (Lacépède).

Chaetodon lunula Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 86, 1932 (Apia, Samoa).

In the Australian Museum materials from Samoa, Solomons, and Vila in the New Hebrides (Whitley).

Chaetodon reticulatus Cuvier.

Chaetodon reticulatus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 10, Feb. 1932 (Pago Pago, Samoa).

Chaetodon melannotus Schneider.

Chaetodon melannotus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 7, fig. 1, 1932 (Suva).

In the Australian Museum materials from Admiralty Islands, Solomons, Duke of York Island, Port Moresby, and southeast New Guinea (Whitley).

Chaetodon ocellicauda Cuvier.

Chaetodon ocellicaudatus Gray: Descr. Cat. Spec. Roy. College Surg., p. 34, 1859 (South Seas).

Chaetodon unimaculatus Bloch.

Chaetodon unimaculatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 12, Oct.-Dec. 1931 (New Hebrides); vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (Tahiti). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 86, 1932 (Raiatea and Bora Bora, Society Islands; Noumea, New Caledonia).

Material from Port Moresby, New Guinea, in the Australian Museum (Whitley).

Chaetodon kleinii Bloch.

Chaetodon kleinii Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 72, 1931 (St. Matthias, Ekaliu).

Chaetodon auriga Forskål.

Chaetodon auriga Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 10, Oct.-Dec. 1931 (Moorea, Society Islands). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 10, Feb. 1932 (Apia); vol. 9, no. 20, p. 7, Aug. 1932 (Suva).

Chaetodon setifer Bloch.

Chaetodon setifer Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 2, p. 55, 1930 (Oahu, Hawaiian islands), art. 3, p. 86, 1932 (Bora Bora, Society Islands).

Chaetodon setifer variety *hawaiiensis* Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 2, p. 55, pl. 1, fig. 2, 1930 (type loc., Hawaiian islands).

Australian Museum materials from Samoa, Friendly Islands, Vila in the New Hebrides, and Ontong Java (Whitley).

Chaetodon vagabundus Linnaeus.

Chaetodon vagabundus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 7, 1931 (Tenibuli, Solomons); p. 10 (Moorea, Society Islands); vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (Tahiti). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 8, Aug. 1932 (Suva). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 86, 1932 (Apia, Samoa).

Materials in the Australian Museum from Solomons, Samoa, Bougainville Island, Duke of York Island, Fiji, Gilbert Islands, Vate in the New Hebrides, and New Guinea (Whitley).

Chaetodon rafflesii Bennett.

Chaetodon rafflesi Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 7, Oct.-Dec. 1931 (Tenibuli and Ugi, Solomons).

Chaetodon rafflesii Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 8, Aug. 1932 (Suva).

Materials from Samoa, New Britain, Admiralty Islands, Duke of York Island, Gizo and Bougainville in the Solomons, and Port Moresby, New Guinea, in the Australian Museum (Whitley).

Chaetodon lineolatus Cuvier.

Chaetodon lineolatus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 2, p. 55, 1930 (Oahu, Hawaiian islands).

Materials in the Australian Museum from the Friendly Islands, Admiralty Islands, and Port Moresby, New Guinea (Whitley).

Chaetodon fasciatus Forskål.*

Chaetodon fasciatus Forskål: Descr. animalium, pp. xii, 59, 1775 (type loc., Djedda, Red Sea). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 130, Oct.-Dec. 1931 (Hathorne Sound and Tenibuli, Solomons); p. 12 (New Hebrides); vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (Tahiti).

Previously only known from the Red Sea, Malabar, Philippines, and China.

Chaetodon falcula Bloch.

Chaetodon falcula Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 86, 1932 (Raiatea, Society Islands).

Chaetodon ulietensis Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 10, Oct.-Dec. 1931 (Moorea, Society Islands); vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (Tahiti).

Material in the Australian Museum from "German New Guinea" (Whitley).

Chaetodon plebeius Cuvier.

Chaetodon plebeius Gray: Descr. Cat. Spec. Roy. College Surg., p. 34, 1859 (South Seas).

Australian Museum materials from the New Hebrides, Friendly Islands, and southeast New Guinea (Whitley).

Chaetodon triangulum Cuvier.

Chaetodon triangulum Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 7, Oct.-Dec. 1931 (Tenibuli, Solomons); p. 12 (New Hebrides).

In the Australian Museum materials from the Solomons, some from Numa Numa on Bougainville Island (Mrs. P. Mildwater), New Britain, Admiralty Islands, New Guinea, and Port Moresby (Whitley).

Chaetodon trifascialis Quoy and Gaimard.

Chaetodon trifascialis Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 10, Feb. 1932 (Fagamalo, Samoa).

Megaprotodon strigangulus Borodin: Vanderbilt Mar. Mus., Bull., vol. 3, p. 87, 1932 (Raiatea, Society Islands).

Australian Museum materials from Bougainville, Solomons, and the southeast coast of New Guinea (Whitley).

Microcanthus strigatus (Cuvier).

Microcanthus strigatus Pietschman: B. P. Bishop Mus., Bull. 73, p. 16, 1930 (Honolulu).

Heniochus varius (Cuvier).

Material from Port Moresby, New Guinea, in the Australian Museum (Whitley).

Heniochus permutatus Cuvier.

Heniochus permatatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 13, Oct.-Dec. 1931 (New Hebrides) (error).

Heniochus permutatus Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 4, 1932 (Tahiti). Borodin: Vanderbilt Mar. Mus., Bull., vol 1, art. 3, p. 87, 1932 (Raiatea, Society Islands).

Heniochus chrysostomus Pietschmann: B. P. Bishop Mus., Bull. 73, p. 16, pl. 14, 1913 (Guam).

Material from Hood Bay, New Guinea, in the Australian Museum (Whitley).

Heniochus acuminatus (Linnaeus).

Heniochus acuminatus Pietschmann: B. P. Bishop Mus., Bull. 73, p. 16, pl. 3, *A-B*, 1930 (Suva).

Materials from the Hawaiian islands, Narokorokoyawa in Fiji, and Hood Bay, New Guinea, in the Australian Museum (Whitley).

Chaetodontoplus mesoleucus (Bloch).*

Chaetodon mesoleucus Bloch: Naturg. Ausl. Fische, vol. 3, p. 117, pl. 216, fig. 2, 1787 (type loc., "Japan" likely East Indies).

Chaetodontoplus mesoleucus Fraser-Brunner: Zool. Soc. London, Proc., p. 549, Sept. 20, 1933 (New Britain).

Holacanthus bicolor variety *oahuensis* Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 2, p. 56, 1930 (type loc., "Oahu, Hawaiian Islands"—doubtless erroneous locality, as somewhere in the East Indies more likely).

This species previously only reported from the East Indies as Borodin's record needs confirmation.

Pomacanthus imperator (Bloch).

Holacanthus imperator Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 8, fig. 2, Aug. 1932 (Suva).

Pomacanthus imperator Fraser-Brunner: Zool. Soc. London, Proc., p. 556, pl. 1, Sept. 20, 1933 (Rotuma, Samoa, New Britain, Hinapou).

Holacanthus nicobariensis Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 13, Oct.-Dec. 1931 (New Hebrides). Fowler: U. S. Nat. Mus., Proc., vol. 81, art. 8, p. 4, 1932 (Niuafoou).

Admiralty Islands material in the Australian Museum, also some in *Holacanthus nicobariensis* stage from Santo and Aneiteum in New Hebrides, Suva (J. S. Callaghan), in Fiji (Whitley). In "Fishes of Oceania" and "Supplement 1" as *Holacanthus imperator* and *Holacanthus nicobariensis*.

Pomacanthus semicirculatus (Lesson).

Holacanthus semicirculatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 13, Oct.-Dec. 1931 (New Hebrides).

Pomacanthus semicirculatus Fraser-Brunner: Zool. Soc. London, Proc., p. 563, text fig. 10, Sept. 20, 1933 (Fiji).

Australian Museum materials from the New Hebrides, Bougainville, Solomons, Engineer Group, New Guinea (Whitley). In "Fishes of Oceania" and "Supplement 1" as *Holacanthus semicirculatus*.

Heteropyge sexstriatus (Cuvier).

Holacanthus sexstriatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 7, Oct.-Dec. 1931 (Tenibuli, Solomons).

Heteropyge sexstriatus Fraser-Brunner: Zool. Soc. London, Proc., p. 569, text fig. 12, Sept. 20, 1933 (Pelew Islands).

Material from Port Moresby, New Guinea, in the Australian Museum (Whitley). This species as *Holacanthus sexstriatus* in "Fishes of Oceania."

Heteropyge xanthometopon (Bleeker).

Heteropyge xanthometopon Fraser-Brunner: Zool. Soc. London, Proc., p. 570, text fig. 13, Sept. 20, 1933 (Pelew Islands; Ponape).

As *Holacanthus xanthometopon* in "Fishes of Oceania." Australian Museum material from the Admiralty Islands (Whitley).

Heteropyge navarchus (Cuvier).

As *Holacanthus navarchus* in "Fishes of Oceania."

Genicanthus lamarck (Lacépède).

As *Holacanthus lamarck* in "Fishes of Oceania."

Holacanthus arcuatus Gray.

Holacanthus arcuatus Fraser-Brunner: Zool. Soc. London, Proc., p. 578, text fig. 19, Sept. 20, 1933 (type).

Pygoplites diacanthus (Boddaert).

Holacanthus diacanthus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 86, 1932 (Society Islands).

Pygoplites diacanthus Fraser-Brunner: Zool. Soc. London, Proc., p. 587, text fig. 25, Sept. 20, 1933 (Duke of York Island; Samoa).

In the Australian Museum materials from Samoa, Solomons, and Admiralty Islands (Whitley). As *Holacanthus diacanthus* in "Fishes of Oceania."

Centropyge bicolor (Bloch).

Centropyge bicolor Fraser-Brunner: Zool. Soc. London, Proc., p. 589, text fig. 26, Sept. 20, 1933 (Pelew Islands; Solomons).

Australian Museum materials from Samoa, Solomons, Numa Numa on Bougainville Island (Mrs. P. Mildwater), New Britain and Port Moresby, New Guinea (Whitley). This species as *Holacanthus bicolor* in "Fishes of Oceania" and "Supplement 1."

Centropyge tibicen (Cuvier).

Centropyge tibicen Fraser-Brunner: Zool. Soc. London, Proc., p. 591, Sept. 20, 1933 (Pelew Islands; Lord Howe Island; New Hebrides).

As *Holacanthus tibicen* in "Fishes of Oceania."

Centropyge multispinis (Playfair).*

Holacanthus multispinis Playfair: Fishes of Zanzibar, p. 37, pl. 6, fig. 4, 1866 (type loc., Zanzibar).

Centropyge multispinis Fraser-Brunner: Zool. Soc. London, Proc., p. 591, Sept. 20, 1933 (New Hebrides).

Known from Zanzibar, Ceylon, and New Hebrides.

Centropyge nox (Bleeker).

As *Holacanthus nox* in "Fishes of Oceania."

Centropyge bispinosus (Günther).

Holacanthus bispinosus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 87, 1932 (Noumea, New Caledonia).

Centropyge bispinosus Fraser-Brunner: Zool. Soc. London, Proc., p. 592, Sept. 20, 1933 (New Hebrides; Samoa).

As *Holacanthus bispinosus* in "Fishes of Oceania." Though Fraser-Brunner unites the two following species with the present one, they appear distinct as to coloration in fresh or living materials.

Centropyge potteri (Jordan and Metz).

As *Holacanthus potteri* in "Fishes of Oceania" and "Supplement 1."

Centropyge loriculus (Günther).

As *Holacanthus loriculus* in "Fishes of Oceania."

Centropyge vrolikii (Bleeker).

Holacanthus vroliki Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 7, Oct.-Dec. 1931 (Tenibuli, Solomons).

Centropyge vrolicki Fraser-Brunner: Zool. Soc. London, Proc., p. 593, Sept. 20, 1933 (Solomons; Mortlock).

In the Australian Museum materials from Solomons, Bougainville Strait in the New Hebrides, and New Britain (Whitley). This species as *Holacanthus vrolikii* in "Fishes of Oceania" and "Supplement 1."

Centropyge flavissimus (Cuvier).

Holacanthus flavissimus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 10, Feb. 1932 (Fagamalo, Samoa). Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (Tahiti).

Centropyge flavissimus Fraser-Brunner: Zool. Soc. London, Proc., p. 594, text fig. 27, Sept. 20, 1933 (Kandava, New Hebrides, Fortuna, Rotuma, Samoa, Raiatea, Tahiti).

Holacanthus uniocellatus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 86, pl. 1, fig. 2, 1932 (type loc., Pago Pago, Samoa).

In the Australian Museum materials from Samoa and Vaitupu, Ellice Islands, as "mumulaufatu" (canary fish) (Whitley). In "Fishes of Oceania" and "Supplement 1" as *Holacanthus flavissimus*.

Centropyge fisheri (Snyder).

Centropyge fisheri Fraser-Brunner: Zool. Soc. London, Proc., p. 596, Sept. 20, 1933 (Hawaii).

As *Holacanthus fisheri* in "Fishes of Oceania" and "Supplement 1."

ZANCLIDAE

Zanclus canescens (Linnaeus).

Zanclus canescens Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (Tahiti). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 87, 1932 (Raiatea, Society Islands).

Chaetodon cornutus Gray: Descr. Cat. Spec. Roy. College Surg., p. 35, 1859 (Mauritius; Sandwich Islands).

Zanclus cornutus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 10, Oct.-Dec. 1931 (Moorea, Society Islands); vol. 7, no. 1, p. 4, Jan.-Mar. 1932 (Tahiti). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 87, 1932 (Apia, Samoa).

In the Australian Museum materials from Hawaiian islands, Funafuti, Duke of York Island, New Hebrides, Samoa, Bougainville, and Gizo in the Solomons (Whitley).

HEPATIDAE

Hepatus triostegus (Linnaeus).

Chaetodon triostegus Gray: Descr. Cat. Spec. Roy. College Surg., p. 36, 1859 ("Pacific Ocean").

Hepatus triostegus Fowler: U. S. Nat. Mus. Proc., vol. 80, art. 6, p. 10, 1932 (Ua Huka; Taiohae, Nukuhiva, Marquesas Islands); B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 11, Feb. 1932 (Apia); U. S. Nat. Mus., Proc., vol. 81, art. 8, p. 5, 1932 (Niuafoou Island); B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 8, Aug. 1932 (Suva). Ginsburg: B. P. Bishop Mus., Bull. 107, p. 20, 1933 (Pearl and Hermes Reef).

Acanthurus triostegus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 13, Oct.-Dec. 1931 (New Hebrides); vol. 7, no. 1, p. 5, Jan.-Mar. 1932 (Tahiti). Giltay: Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 86, 1933 (Manokwari, New Guinea).

Acanthurus triastegus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 87, 1932 (Apia; Bora Bora; Raiatea) (error).

Teuthis troughtoni Whitley: Australian Mus., Rec., vol. 16, no. 4, p. 233, pl. 16, fig. 1, Mar. 28, 1928 (type loc., Naunaha Island, Vanikoro Lagoon, Santa Cruz Group; Peu, Vanikoro; Queensland; New Guinea).

Hepatus sandvicensis Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 88, 1932 (Venus Point Reef, Tahiti).

In the Australian Musuem type of *Teuthis troughtoni* from Vaitupu as "manini" (striped surgeon fish), Ellice Islands (Whitley).

Hepatus guttatus (Schneider).

Hepatus guttatus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 11, Feb. 1932 (Apia). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 88, 1932 (Noumea, New Caledonia).

In the Australian Museum material from Vaitupu as "maono" (white spotted surgeon fish) in Ellice Islands

Hepatus fuliginosus (Lesson).

Hepatus fuliginosus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 88, 1932 (Fare Harbor, Huahine, Society Islands).

Acanthurus matoides Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 7, Oct.-Dec. 1931 (Tenibuli, Solomons); vol. 7, no. 1, p. 5, Jan.-Mar. 1932 (Tahiti). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 87. 1932 (Bora Bora, Society Islands).

Material in the Australian Museum from Funafuti (Whitley).

Hepatus elongatus (Lacépède).

Acanthurus elongatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 12, Dec. 1931 (New Hebrides).

Australian Museum materials from Vaitupu as "pone" (black surgeon fish), Ellice Islands (Whitley).

Hepatus flavoguttatus (Kittlitz).

Acanthurus flavoguttatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 13, Oct.-Dec. 1931 (New Hebrides).

Hepatus lineatus (Linnaeus).

Acanthurus lineatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 7, Oct.-Dec. 1931 (Tenibuli, Solomons), p. 13 (New Hebrides). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 87, 1932 (Bora Bora, Society Islands).

Hepatus lineatus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 11, Feb. 1932 (Apia).

Material in the Australian Museum from Vaitupu, Ellice Islands, as "ponelolo" (striped surgeon fish) (Whitley).

Hepatus lineolatus (Valenciennes).

Hepatus lineolatus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 11, Feb. 1932 (Fagamalo and Pago Pago, Samoa). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 88, 1932 (Raiatea, Society Islands).

Hepatus olivaceus (Schneider).

Hepatus olivaceus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 11, Feb. 1932 (Fagamalo and Pago Pago, Samoa). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 88, 1932 (Raiatea, Society Islands).

Hepatus nigricans (Linnaeus).

Hepatus nigricans Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 8, Aug. 1932 (Suva).

Acanthurus gahm Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 7, Oct.-Dec. 1931 (Tenibuli, Solomons). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 87, 1932 (Noumea, New Caledonia).

Hepatus glaucopareius (Schneider).

Acanthurus glaucopareius Gray: Descr. Cat. Spec. Roy. College Surg., p. 38, 1859 ("South Seas").

Acanthurus aliaia Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 10, Oct.-Dec. 1931 (Moorea, Society Islands); vol. 7, no. 1, p. 5, Jan.-Mar. 1931 (Tahiti).

Materials in the Australian Museum from Samoa and Hood Bay, New Guinea (Whitley).

Hepatus leucosternon (Bennett).

Acanthurus leucosternon Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 7, Oct.-Dec. 1931 (Solomons).

Acanthurus celebicus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 87, 1932 (Noumea, New Caledonia).

Hepatus achilles (Shaw).

Hepatus achilles Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 88, 1932 (Apia, Raiatea, Bora Bora).

Materials in the Australian Museum from Funafuti, Hawaii, and Suwarow (Whitley).

Ctenochaetus strigosus (Bennett).

Ctenochetus strigosus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 2, p. 58, 1930 (Maui; Honolulu) (error).

Ctenochaetus strigosus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 7, Oct.-Dec. 1931 (Tenibuli, Solomons), p. 10 (Moorea, Society Islands); vol. 7, no. 1, p. 5, Jan.-Mar. 1932 (Tahiti). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 11, Feb. 1932 (Apia, Fagamalo and Pago Pago, Samoa). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 88, 1932 (Raiatea, Bora Bora, Pago Pago, Apia).

Ctenochaetus striatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 10, Oct.-Dec. 1931 (Moorea, Society Islands).

In the Australian Museum materials from Hawaii, Samoa, Solomons, Suwarow, New Hebrides, Peleni Island of Reef Group of the Santa Cruz Archipelago and New Guinea (Whitley).

Zebrasoma rhombeum (Kittlitz).

Zebrasoma rhombeum Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 88, 1932 (Raiatea, Society Islands).

Samoan material in the Australian Museum (Whitley).

Zebrasoma veliferum (Bloch).

Zebrasoma velifer Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 2, p. 57, 1930 (Honolulu).

Zebrasoma veliferum Herr: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 7, Oct.-Dec. 1931 (Tenibuli, Solomons). Borodin: Vanderbilt Mar. Mus., vol. 1, art. 3, p. 88, 1932 (Bora Bora; Raiatea). Ginsburg: B. P. Bishop Mus., Bull. 107, p. 20, 1933 (Pearl and Hermes Reef).

Zebrasoma veliforum novae caledoniae Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, 1932 (type loc., Noumea, New Caledonia) (error).

New Guinea material in the Australian Museum (Whitley).

Naso lituratus (Schneider).

Callicanthus lituratus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 2, p. 58, 1930 (Oahu); vol. 1, art. 3, p. 88, 1932 (Bora Bora; Raiatea).

Naso lituratus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 13, Oct.-Dec. 1931 (New Hebrides). Fowler: U. S. Nat. Mus., Proc., vol. 81, art. 8, p. 5, 1932 (Niuafoou).

Materials in the Australian Museum from the Hawaiian islands, Funafuti, New Hebrides, Solomons, Suwarow, Reef Island in the Santa Cruz Group, Samoa, Ontong Java, and Port Moresby, New Guinea (Whitley). In Bernice P. Bishop Museum one 91 mm long from off Avarua Harbor, Rarotonga, Cook Islands, on July 8, 1929, Wilder and Parks collection.

Naso unicornis (Forskål).

Nasus unicornis Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 88, 1932 (Raiatea, Society Islands) (error).

Hawaiian and Port Moresby materials in the Australian Museum (Whitley).

SIGANIDAE

Siganus javus (Linnaeus).

Australian Museum from Aneiteum, New Hebrides (Whitley).

Siganus canaliculatus (Mungo Park).

Material in the Australian Museum from Vanikoro, Santa Cruz Islands, as *Amphacanthus margaritiferus,* topotypical (Whitley).

Siganus vermiculatus (Valenciennes) (fig. 3).

Teuthis vermiculatus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 89, 1932 (Apia, Samoa; Noumea, New Caledonia).

Siganus vermiculatus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 9, Aug. 1932 (Suva).

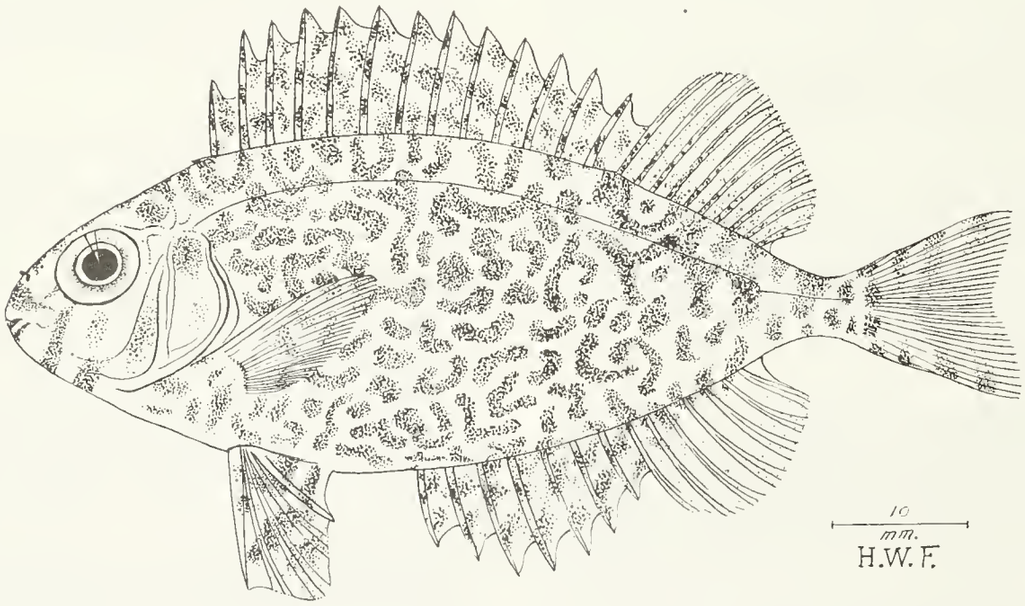

FIGURE 3.—*Siganus vermiculatus* (Valenciennes), Avarua, Rarotonga, June 15, 1929.

Naso tuberosus Lacépède.

Material in the Australian Museum from Port Moresby (Whitley).

Naso eoume (Lesson).

Naso eoume Fowler: U. S. Nat. Mus., Proc., vol. 80, art. 6, p. 10, 1932 (Hanamui, Uahuka, Marquesas Islands).

Naso annulatus (Quoy and Gaimard).

Acanthurus insipiens Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 88, 1932 (Apia, Samoa) (error).

In the Australian Museum material from Port Moresby, New Guinea (Whitley).

Naso brevirostris (Valenciennes).

Australian Museum material from Port Moresby (Whitley).

Australian Museum materials from Titerri, Solomons, and Port Moresby, New Guinea (Whitley).

In Bernice P. Bishop Museum one 72 mm from Avarua, Rarotonga, on June 15, 1929. This and the next from shallow pools by using vegetable poison (*Tephrosa piscatoria*) and a vine from New Guinea.

Siganus rostratus (Valenciennes).

One 103 mm from Avarua, Rarotonga, on June 15, 1929. Although in most every way agreeing with Günther's figure, it does not show any traces of the very small close-set spots. This specimen also in Bernice P. Bishop Museum.

Australian Museum materials from Samoa and Funafuti (Whitley).

Siganus spinus (Linnaeus).

Teuthis marmorata Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 89, 1932 (Suva).

Teuthis striolata Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 5, Jan.-Mar. 1932 (Tahiti).

In the Australian Museum materials from Samoa, the New Hebrides at Vila, Vate and Santo, also Narokorokoyawa in Fiji (Whitley).

Siganus punctatus (Schneider).

Teuthis hexagonatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 7, Oct.-Dec. 1931 (Tenibuli, Solomons).

Australian Museum material from Engineer Group (Whitley).

Siganus fuscescens (Houttuyn).

In the Australian Museum material from New Britain (Whitley).

Siganus oramin (Schneider).*

Amphacanthus guttatus variety *oramin* Schneider: Syst. Ichth. Bloch, p. 207, pl. 48, 1801 (type loc., Tranquebar).

Teuthis oramin Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 7, Oct.-Dec. 1931 (Tenibuli, Solomons).

Previously known from Arabia, Natal, Madagascar, India, East Indies, and the Philippines. Australian Museum material from Port Moresby, New Guinea (Whitley).

Siganus argenteus (Quoy and Gaimard).

Siganus rostratus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 11, fig. 1, Feb. 1932 (Pago Pago).

Siganus lineatus (Valenciennes).

Amphacanthus lineatus Whitley: Australian Mus., Rec., vol. 16, no. 4, p. 231, Mar. 28, 1928 (Vanikoro, Santa Cruz Group).

Teuthis lineata Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 7, Oct.-Dec. 1931 (Tenibuli, Solomons).

Siganus sevenlineatus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 2, p. 58, pl. 2, fig. 3, 1930 (type loc., Truk Island, Carolines).

Australian Museum material from Vanikoro (Whitley). The nominal species *Siganus sevenlineatus* Borodin, erected on a single young specimen but 55 mm long without caudal fin, is unfortunate. It shows every indication of the young of the present species. Its author has strayed from the accepted usage of Latin binomials in proposing such a specific monstrosity as *sevenlineatus!*

Siganus doliatus Griffith.

Siganus doliatus Griffith: Animal Kingdom, Cuvier, vol. 10, pl. 33, fig. 1 (opposite p. 214), 1834 (type loc. not given).

Teuthis doliata Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 7, Oct.-Dec. 1931 (Tenibuli, Solomons).

Mr. Whitley calls my attention to Griffith's name and figure as antedating that of Valenciennes 1835. He also mentions a fine young example from the New Hebrides (no. 1. 13560 A. M.). Valenciennes as the accepted authority for this species as given in "Fishes of Oceania" and "Supplement 1" will therefore give place to the above.

Siganus puellus (Schlegel).

Teuthis puella Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 7, Oct.-Dec. 1931 (Tenibuli, Solomons).

Siganus concatenatus (Valenciennes).

Hepatus concatenatus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 88, 1932 (Noumea, New Caledonia) (lapsus generically).

Lo vulpinus (Schlegel).

Lo vulpinus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 7, Oct.-Dec. 1931 (Tenibuli, Solomons).

SCORPAENIDAE

Scorpaena picta Cuvier.*

Scorpaena picta (Kuhl and Van Hasselt) Cuvier: Hist. Nat. Poiss., vol. 4, p. 236, 1829 (type loc., Java). Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 69, 1931 (Frederick Wilhelm Harbor, New Guinea).

Known from the East Indies.

Scorpaenopsis cirrhosus (Thunberg).

Scorpaenopsis leonina Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 89, 1932 (Venus Point, Tahiti, Society Islands).

Australian Museum material from southeast New Guinea (Whitley).

Scorpaenopsis novae-guineae (Cuvier).

Scorpaena novae-guineae Gray: Descr. Cat. Spec. Roy. College Surg., pp. 26, 140, 1859 (Fiji).

Scorpaenopsis gibbosus (Schneider).

Scorpaenopsis gibbosus Pietschmann: B. P. Bishop Mus., Bull. 73, p. 17, 1930 (Waikiki Reef).

Australian Museum materials from Bougainville Island in the Solomons, Rarotonga, and Banks Islands (Whitley).

Sebastapistes albobrunneus (Günther).

Sebastapistes coniorta Pietschmann: B. P. Bishop Mus., Bull. 73, p. 17, 1930 (Pearl and Hermes Reef).

In Bernice P. Bishop Museum four, 41 to 69 mm, from Waikiki reef, Honolulu, in Nov. 1928 Itagaki collection.

Sebastapistes bynoensis (Richardson).

Scorpaena bynoensis McCulloch: Australian Mus., Rec., vol. 15, no. 1, p. 36, Apr. 15, 1926 (New Hebrides; Samoa).

Sebastapistes bynoensis Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 5, Jan.-Mar. 1932 (Tahiti).

Australian Museum materials from Samoa, Suva (J. S. Callaghan), and New Hebrides (Whitley).

Scorpaenodes guamensis (Quoy and Gaimard).

Scorpaena guamensis Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 69, 1931 (St. Matthias, Ekaliu; Frederick Wilhelm Harbor and Kelana Harbor, New Guinea).

Scorpaenodes guamensis Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 13, Oct.-Dec. 1931 (New Hebrides); vol. 7, no. 1, p. 5, Jan.-Mar. 1932 (Tahiti).

In the Australian Museum materials from Samoa, New Hebrides, Duke of York Island, Tongatabu, Bougainville, and Ysabel in the Solomons (Whitley).

Scorpaenodes kelloggi (Jenkins).

Sebastopsis kellogi Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 2, p. 59, 1930 (Pearl Harbor, Oahu).

Scorpaenodes scabra (Ramsay and Ogilby).

Scorpaenodes scabra Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 13, Oct.-Dec. 1931 (New Hebrides); vol. 7, no. 1, p. 5, Jan.-Mar. 1932 (Tahiti). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 9, Aug. 1932 (Suva).

In Bernice P. Bishop Museum one 95 mm long from Avarua, Rarotonga, on June 15, 1929. From shallow pools by using vegetable poison. As this specimen differs a little from Bleeker's figure I have given the accompanying detail. It shows white ventral rays.

Pterois radiata Cuvier.

Pterois radiata Pietschmann: B. P. Bishop Mus., Bull. 73, p. 17, 1930 (Papara, Tahiti). Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 5, Jan.-Mar. 1932 (Tahiti).

Pterois cincta Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 89, 1932 (Venus Point Reef, Tahiti) (error).

In the Australian Museum material from Vaitupu as butterfly cod or fire fish, Ellice Islands (Whitley).

FIGURE 4.—*Pterois antennata* (Bloch), Avarua, Rarotonga, June 15, 1929.

Pontinus spilistius Gilbert.

Pontinus spilistius Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 2, p. 59, 1930 (Oahu).

Pterois volitans (Linnaeus).

Pterois volitans Borodin: Vanderbilt Mar. Mus., Bull., vol 1, art. 3, p. 89, 1932 (Suva). Herre: Pan-Pac. Research Inst., Jour., vol. 8, no. 4, p. 12, Oct.-Dec. 1933 (Madang, New Guinea).

In the Australian Museum materials from New Hebrides, Santa Cruz Islands, Vanua Lava in Banks Group, Bougainville in the Solomons, and Port Moresby, New Guinea (Whitley).

Pterois antennata (Bloch) (fig. 4).

Pterois antennata Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 69, 1931 (Frederick Wilhelm Harbor, New Guinea; St. Matthias, Ekaliu; Rein Bay, north coast New Pomerania). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 18, Oct.-Dec. 1931 (Tenibuli, Solomons).

Australian Museum materials from the Admiralty Islands and "German New Guinea" (Whitley).

One 169 mm long in Bernice P. Bishop Museum, from Raiatea, Society Islands, taken in 1927 by John W. Moore. Differs from Günther's figure in that the pale browny-like marks along the upper edge of the back are only developed at the end of the second and fourth pale transverse lines to the bases of the dorsal fins. The blackish oblique band from the lower hind eye edge extends back to the edge of the gill opening.

Dendrochirus brachypterus (Cuvier).

Dendrochirus chloreus Pietschmann: B. P. Bishop Mus., Bull. 73, p. 18, 1930 (Kaneohe Bay, Oahu, Hawaiian islands).

Material in the Australian Museum from Tongatabu (Whitley).

One in Bernice P. Bishop Museum 71 mm long, from Kewalo Bay 5,000 feet from shore under coral rock, Oahu, on August 3, 1928, by J. M. Ostergaard.

Amblyapistus longispinis (Cuvier).*

Apistus longispinis Cuvier: Hist. Nat. Poiss., vol. 4, p. 300, 1829 (type loc., Amboina).

Material in the Australian Museum as *Paracentropogon longispinis?* from the New Hebrides (Whitley).

Tetraroge crista-galli Günther.*

Tetraroge crista-galli Günther: Cat. Fishes Brit. Mus., vol. 2, p. 134, 1860 (type loc., Philippines). Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 70, 1931 (Dörper Point, Southeast Bay, New Guinea).

Tetraroge albifrons Duncker and Mohr.*

Tetraroge albifrons Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 70, 1931 (type loc., East Coast, Langemok Bay, New Guinea: Dörper Point, South East Bay).

Taenianotus triacanthus Lacépède.

Taenianotus citrinellus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 2, p. 59, 1932 (Pearl Harbor, Oahu).

An example 75 mm long in the Australian Museum from the Solomons (Whitley).

Synanceja verrucosa Schneider.

Synanceja verrucosa Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 12, Feb. 1932 (Apia, Samoa).

Materials in the Australian Museum from Suva, Fiji, and Bougainville in the Solomons (Whitley).

Synancidium horridum (Linnaeus).

In the Australian Museum material from Efati and Vila in the New Hebrides (Whitley).

Choridactylus multibarbis Richardson.*

Choridactylus multibarbis Richardson: Voy. Samarang, Fishes, p. 8, pl. 2, figs. 1-3, 1844 (type loc., China). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 89, 1932 (Raiatea, Society Islands).

An addition to the fauna of Oceania.

Pelor didactylum (Pallas).

Materials in the Australian Museum from New Ireland and the Solomons (Whitley).

CARACANTHIDAE

Caracanthus maculatus (Gray).

Caracanthus maculatus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 2, p. 59, 1930 (Oahu). Ginsburg: B. P. Bishop Mus., Bull. 107, p. 20, 1933 (Pearl and Hermes Reef).

Micropus zeylonicus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 91, 1932 (Raiatea and Venus Point Reef, Tahiti).

Australian Museum materials from Dauco Island and Engineer Group (Whitley).

Caracanthus unipinna (Gray).

In the Australian Museum types of *Trachycephalus bankiensis* De Vis, 34 mm long from Reef Island of Banks Group, New Hebrides, Pelew Islands, and Tupusalei near Port Moresby, New Guinea (Whitley).

HOPLICHTHYIDAE

Hoplichthys citrinus Gilbert.

Hawaiian material in the Australian Museum (Whitley).

PLATYCEPHALIDAE

Thysanophrys crocodilus (Tilesius).

Material in the Australian Museum from the New Hebrides (Whitley).

PERISTEDIIDAE

Peristedion engyceros (Günther).

Hawaiian material in the Australian Museum (Whitley).

TRIGLIDAE

Chelidonichthys kumu (Cuvier).

Trigla kumu Pietschmann: B. P. Bishop Mus., Bull. 73, p. 18, 1930 (near Napoopoo on west coast of Hawaii).

CEPHALACANTHIDAE

Dactyloptena orientalis (Cuvier).

Materials from Honolulu and the New Hebrides in the Australian Museum (Whitley).

POMACENTRIDAE

Premnas biaculeatus (Bloch).

Australian Museum materials from the Solomons, Duke of York Island, and Port Moresby, New Guinea (Whitley).

Amphiprion polymnus (Linnaeus).

Amphiprion polymnus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 93, 1932 (Raiatea, Society Islands).

Amphiprion bicinctus Rüppell.

Type of *Amphiprion papuensis* 87 mm long from D'Entrecasteaux Group, besides materials from Suva and New Britain in the Australian Museum (Whitley).

Amphiprion melanopus Bleeker.

Materials from D'Entrecasteaux Group and Duke of York Island in the Australian Museum (Whitley).

Amphiprion percula (Lacépède).

Amphiprion percula Gray: Descr. Cat. Spec. Roy. College Surg., p. 30, 1859 ("brought by Commodore Byron from the newly discovered island in the South Seas"). Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 68, 1931 (Hanam Harbor, north coast New Pomerania; Kewieng Nusa, north coast New Mecklenburg; St. Matthias, Ekaliu). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Tenibuli and Hathorne Sound, Solomons).

Australian Museum materials from the Line Islands, Duke of York Island, Ugi in the Solomons, and "German New Guinea" (Whitley).

Amphiprion rosenbergi Bleeker.

Amphiprion rosenbergi Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 68, 1931 (St. Matthias, Ekaliu).

Dascyllus trimaculatus (Rüppell).

Dascyllus trimaculatus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 67, 1931 (St. Matthias, Ekaliu). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 10, Oct.-Dec. 1931 (Moorea, Society Islands). Giltay: Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 71, 1933 (Manokwari, New Guinea).

Australian Museum materials from the Solomons and New Guinea, also Hawaii (Whitley).

Dascyllus marginatus (Rüppell).

Materials from the New Hebrides and Duke of York Island in the Australian Museum (Whitley). In "Fishes of Oceania" in the citation for Whitley's record the page is 23, not 17 as there given.

Dascyllus melanurus Bleeker.

Dascyllus melanurus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 67, 1931 (Gazelle Peninsula, Blanche Bay, west coast of Vulcan Island; Kewieng Nusa, north coast of New Mecklenburg).

Material in the Australian Museum from Duke of York Island (Whitley).

Dascyllus aruanus (Linnaeus).

Dascyllus aruanus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 12, Feb. 1932 (Pago Pago); vol. 9, no. 20, p. 9, Aug. 1932 (Suva). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 93, 1932 (Suva, Pago Pago, Raiatea).

Dascyllus aruanus variety *nigrus* Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 93, 1932 (type loc., Reef of Bali, Dutch East Indies) (error).

Materials in the Australian Museum from Samoa, Fiji, Funafuti, Solomons, Friendly Islands, New Hebrides, Duke of York Island, Bismark Archipelago, Port Moresby, and Dauco Island, New Guinea (Whitley). Borodin's new varietal name *"nigrus"* is not only of improper form but also preoccupied by *Dascyllus niger* Bleeker in 1846-47, as a synonym of *Pomacentrus trimaculatus* Rüppell in 1828.

Dascyllus carneus Fischer.*

Dascyllus carneus Fischer: Jahresb. Hamburg Wiss. Anstalt., vol. 2, p. 71, pl. 2, fig. 5, 1885 (type loc., Mozambique).

Tetradrachmum carneum Whitley: Australian Mus., Rec., vol. 16, no. 4, p. 220, Mar. 28, 1928 (Dauco Island reef off Port Moresby, New Guinea).

Acanthochromis polyacanthus (Bleeker).

Dascyllus polyacanthus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 68, 1931 (Möwe Harbor, south coast New Pomerania).

Acanthochromis polyacanthus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Auki and Tenibuli, Solomons), p. 13 (New Hebrides).

Material in the Australian Museum from Bougainville Island, Solomons (Whitley).

Chromis elerae Fowler and Bean.*

Chromis elerae Fowler and Bean: U. S. Nat. Mus., Bull. 100, vol. 7, p. 52, pl. 4, 1932 (type loc., Pasacao, Ragay Gulf, Philippines; Biri Channel; Ligpo Point; Powati Harbor; Sablayan; Tulayan). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, no. 3, p. 93, 1932 (Noumea, New Caledonia).

Chromis ternatensis (Bleeker).

Chromis ternatensis Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Tenibuli, New Hebrides), p. 13 (New Hebrides).

In the Australian Museum materials from New Britain and the Santa Cruz Islands (Whitley).

Chromis dimidiatus (Klunzinger).

Chromis dimidiatus Herre: Pan-Pac. Research Inst., Jour., vol. 1, no. 4, p. 10, Oct.-Dec. 1931 (Moorea, Society Islands), p. 13 (New Hebrides).

Chromis iomelas Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 10, Oct.-Dec. 1931 (Moorea, Society Islands).

Materials in the Australian Museum from Funafuti and New Hebrides (Whitley).

Chromis analis (Cuvier).

Samoan material in the Australian Museum (Whitley).

Chromis caeruleus (Cuvier).

Chromis caeruleus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Auki, Tenibuli and Ugi, Solomons), p. 13 (New Hebrides); vol. 7, no. 1, p. 5, Jan.-Mar. 1932 (Tahiti). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 12, Feb. 1932 (Fagamalo and Pago Pago, Samoa); vol. 9, no. 20, p. 10, Aug. 1932 (Suva).

Materials from Samoa, New Britain, Bougainville Island, Solomons, Howla, Aneiteum in New Hebrides, Vavau in Friendly Islands, Dauco Island (Whitley).

Cheiloprion labiatus (Day).*

Pomacentrus labiatus Day: Fishes of India, pt. 3, p. 384, pl. 81, fig. 2, 1877 (type loc. Andaman Islands; Nicobars). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 92, 1932 (Apia, Samoa).

Cheiloprion labiatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Ugi Island, Solomons), p. 13 (New Hebrides).

Previously known from the Andamans, Nicobars, East Indies, and Philippines.

Pomacentrus pavo (Bloch).

Pomacentrus pavo Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Auki, Hathorne Sound and Tenibuli, Solomons), p. 13 (New Hebrides); vol. 7, no. 1, p. 5, Jan.-Mar. 1932 (Tahiti).

Australian Museum materials from Samoa, Santa Cruz Islands, Ugi in Solomons, German New Guinea (Whitley).

Duncker and Mohr (Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 67, 1931) have recorded *Pomacentrus rectifraenum* Gill from Gazelle Peninsula, Blanche Bay, west coast Vulcan Island. I am at a loss to place this record as Gill's species is only known from the western shores of tropical America.

Herre has mentioned a nominal species as *Pomacentrus cranei* (Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931; type loc., Hathorne Sound, Solomons; Tenibuli) without description or figure.

Pomacentrus caeruleus Quoy and Gaimard.*

Pomacentrus caeruleus Quoy and Gaimard: Voy. Uranie, Zool., p. 397, pl. 64, fig. 2, 1824 (type loc., Mauritius). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Hathorne Island, Solomons).

Pomacentrus violescens (Bleeker).*

Pristotis violescens Bleeker: Jour. Indian Arch., vol. 2, p. 637, 1848 (type loc., Sumbawa).

Pomacentrus violescens Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 13, Oct.-Dec. 1931 (New Hebrides).

Previously known from the East Indies and Japan.

Pomacentrus vaiuli Jordan and Seale.

Pomacentrus vaiuli Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 12, Feb. 1932 (Fagamalo, Samoa); vol. 9, no. 20, p. 10, fig. 3, Aug. 1932 (Suva).

Pomacentrus littoralis Cuvier.

Pomacentrus littoralis Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 67, 1931 (Möwe Harbor, south coast New Pomerania). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 13, Oct.-Dec. 1931 (New Hebrides).

Pomacentrus moluccensis Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Tenibuli, Solomons).

New Guinea material in the Australian Museum (Whitley).

Pomacentrus melanopterus Bleeker.

Pomacentrus melanopterus Herre: Pan-Pac. Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Hathorne Sound and Tenibuli, Solomons).

Pomacentrus insolitus Whitley: Australian Mus., Rec., vol. 16, no. 4, p. 221, Mar. 28, 1928 (on *Pomacentrus analis* Macleay 1882, preoccupied by Poey 1868 on a Cuban species).

Pomacentrus tripunctatus Cuvier.

Pomacentrus tripunctatus Herre: Pan-Pac. Research Inst., Jour., no. 4, p. 8, Oct.-Dec. 1931 (Auki, Hathorne Sound and Tenibuli, Solomons). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 10, Aug. 1932 (Suva).

Pomacentrus trilineatus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 66, 1931 (Frederick Wilhelm Harbor, New Guinea).

Pomacentrus biocellatus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 67, 1931 (St. Matthias, Ekaliu).

Pomacentrus dorsalis Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Tenibuli and Ugi, Solomons).

Pomacentrus simsiang Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Tenibuli and Ugi, Solomons).

Pomacentrus tropicus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 13, Oct.-Dec. 1931 (New Hebrides).

Pomacentrus wardi Whitley.*

Pomacentrus wardi Whitley: Australian Mus., Rec., vol. 15, no. 5, p. 30, fig. 1, Apr. 6, 1927 (type loc., Heron Island, Capricorn Group, Great Barrier Reef, Queensland; Cape Wessell, Northern Territory; Hervey Bay District, High Island, McCulloch Reef, Gibson Reef, Queensland); vol. 16, no. 1, p. 17, 1927 (German New Guinea).

Pomacentrus tripunctatus (not Cuvier) Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 311, 1928 (part; on Whitley).

Type and material from German New Guinea in the Australian Museum. This species likely valid and close to *Pomacentrus tripunctatus*.

Pomacentrus prosopotaenia Bleeker.*

Pomacentrus prosopotaenia Bleeker: Nat. Tyds. Ned. Indie, vol. 3, p. 67, 1852 (type loc., Singapore).

Pomacentrus lividus (not Schneider) Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 313, 1928 (part; on Macleay).

Port Moresby material in the Australian Museum (Whitley).

Pomacentrus notophthalmus Bleeker.

Pomacentrus notophthalmus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 66, 1931 (Liebliche Island, southwest coast New Pomerania). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Hathorn Sound and Tenibuli, Solomons), p. 13 (New Hebrides).

Admiralty Island and Solomons material in the Australian Museum (Whitley).

Pomacentrus ovoides Cartier.*

Pomacentrus ovoides Cartier: Ges. Würzburg, Verh., vol. 5, p. 98, 1874 (type loc., Bohol, Philippines: Cavite). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 92, 1932 (Noumea, New Caledonia).

Pomacentrus breviceps (Schlegel and Müller).*

Glyphisodon breviceps Schlegel and Müller: Verh. Nat. Ges. Nederl. Zool., p. 23, 1839-44 (type loc., Indian Ocean, southwest corner of Sumatra). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 92, 1932 (Noumea, New Caledonia).

Pomacentrus lividus (Schneider).

Pomacentrus lividus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Kulambangra Island in fresh water; Tenibuli and Ugi, Solomons), p. 13 (New Hebrides); vol. 7, no. 1, p. 5, Jan.-Mar. 1932 (Tahiti). Fowler: B. P. Bishop Mus., Occ. Papers vol. 9, no. 18, p. 13, Feb. 1932 (Apia); vol. 9, no. 20, p. 11, Aug. 1932 (Suva).

Pomacentrus punctatus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 92, 1932 (Samoa; Fiji).

Samoan material in the Australian Museum (Whitley).

Pomacentrus nigricans (Lacépède).

Pomacentrus nigricans Fowler: U. S. Nat. Mus., Proc., vol. 80, art. 6, p. 11, 1932 (Ua Huka, Marquesas; Taiohae). Herre: Pan.-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Ugi, Solomons), p. 10 (Moorea, Society Islands), p. 13 (New Hebrides); vol. 7, no. 1, p. 5, Jan.-Mar. 1932 (Tahiti). Fowler: B. P. Bishop Mus., vol. 9, no. 18, p. 13, Feb. 1932 (Fagamalo, Pago Pago, and Samoa); vol. 9, no. 20, p. 11, Aug. 1932 (Suva). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 92, 1932 (Apia and Pango Pango, Samoa; Noumea, New Caledonia; Suva, Fiji).

New Hebrides, Samoa, and Roviana in British Solomons (Whitley).

Pomacentrus albofasciatus Schlegel and Müller.

Pomacentrus albofasciatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 13, Oct.-Dec. 1931 (New Hebrides). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 12, Feb. 1932 (Pago Pago).

Materials in the Australian Museum from New Hebrides at Santo and Vila, Duke of York Island, Samoa, Bougainville Island, and Vanua Lava in Banks Group (Whitley).

Pomacentrus amboinensis Bleeker.

Pomacentrus amboinensis Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Hathorne Sound and Tenibuli, Solomons).

In the Australian Museum materials from the New Hebrides and Duke of York Island (Whitley).

Pomacentrus sufflavus Whitley.*

Pomacentrus sufflavus Whitley: Australian Mus., Rec., vol. 16, pt. 1, p. 18, pl. 1, fig. 3, Oct. 7, 1927 (type loc., Michaelmas Bay, off Cairns, North Queensland; Great Barrier Reef).

Material in the Australian Museum from Bougainville Island, Solomons (Whitley).

Pomacentrus rhodonotus Bleeker.*

Pomacentrus rhodonotus Bleeker: Tyds. Ned. Indie, Nat., vol. 4, p. 282, 1853 (type loc., Cauer, Sumatra).

Pomacentrus (Pseudopomacentrus) rhodonotus Bleeker: Verh. Holland. Maatsch. Wet. Haarlem, Nat., no. 6, ser. 3, vol. 2, p. 59, 1877 (Sumatra; Amboina).

Materials in the Australian Museum 28 to 34 mm long, from Santo, New Hebrides (Whitley).

Pomacentrus fasciatus Cuvier.

Material from Doboe, Aru Islands, in the Australian Museum (Whitley).

Pomacentrus bifasciatus Bleeker.

In the Australian Museum material from Duke of York Island (Whitley).

Pomacentrus inornatus De Vis.

Hawaiian material in the Australian Museum (Whitley).

Pomacentrus semifasciatus Günther.

Pomacentrus semifasciatus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 66, 1931 (Gazelle Peninsula, Blanche Bay, Vulcan Island, west coast).

Pomacentrus dimidiatus Bleeker.*

Pomacentrus dimidiatus Bleeker: Akad. Wet. Amsterdam, Verslag., ser. 2, vol. 10, p. 385, 1876 (type loc., Amboina; Timor). Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 66, 1931 (Gazelle Peninsula, Blanche Bay, Vulcan Island, west coast; Kewieng, north coast New Mecklenburg; Hamana Harbor, north coast New Pomerania).

Pomacentrus suvarovensis Stead.*

Pomacentrus suvarovensis Stead: Notes on a small collection of fishes from Suwarow Island (Sydney), p. 4, pl. 1, 1907 (type loc., Suwarow Island).

Type and paratypes in the Australian Museum (no. 1*A*. 2460) from Suwarow Island, through D. G. Stead (Whitley).

Abudefduf saxatilis (Linnaeus).

Abudefduf saxatilis Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Tulagi, Solomons), p. 13, (New Hebrides). Fowler: U. S. Nat. Mus., Proc., vol. 80, art. 6, p. 11, 1932 (Ua Huka, Marquesas Islands).

Materials in the Australian Museum from the New Hebrides and Doboe, Aru Islands (Whitley).

Abudefduf bengalensis (Bloch).

Abudefduf bengalensis Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Tenibuli, Solomons).

Materials in the Australian Museum from Vaitupu in Ellice Islands, as "mutumutu" (demoiselle), and Ontong Java (Whitley).

Abudefduf abdominalis (Quoy and Gaimard).

Hawaiian material in the Australian Museum (Whitley).

Abudefduf sexfasciatus (Lacépède).

Abudefduf sexfasciatus Giltay: Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 74, 1933 (Menokwari, New Guinea).

Glyphisodon coelestinus Whitley: Austral. Zool., vol. 4, pt. 4, p. 230, Apr. 1926 (New Hebrides; Samoa; Friendly Islands).

Glyphidodon coelestinus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 67, 1931 (Möwe Harbor, New Pomerania; Dörper Point, South East Bay, New Guinea). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 93, 1932 (Anako Bay, Nuka Hiva, Marquesas Islands).

Abudefduf coelestinus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Tenibuli, Solomons), p. 10 (Moorea, Society Islands); vol. 7, no. 1, p. 5, Jan.-Mar. 1932 (Tahiti).

Materials in the Australian Museum from Vate in the New Hebrides, Samoa, Friendly Islands, Santa Cruz Islands and Funafuti, the last as *Glyphisodon sordidus* by Waite (Whitley).

Abudefduf sordidus (Forskål).

Abudefduf sordidus Fowler: U. S. Nat. Mus., Proc., vol. 80, art. 6, p. 11, 1932 (Marquesas Islands; Ua Huka; Eiao; Taiohae, Nukuhiva). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 13, Oct.-Dec. 1931 (New Hebrides). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 13, Feb. 1932 (Apia); U. S. Nat. Mus., Proc., vol. 81, art. 8, 1932 (Niuafoou). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 92 (Noumea, New Caledonia; Anako Bay, Nuka Hiva, Marquesas Islands), p. 93, 1932 (Bora Bora, Society Islands).

Glyphidodon sordidus Duncker and Mohr: Naturh. Mus. Hamburg., Mitteil., vol. 44, p. 67, 1931 (Dörper Point, South East Bay, New Guinea; Linden Harbor, south coast New Pomerania).

Glyphidodon leucopleurus Borodin: Vanderbilt Mar. Mus., Bull., vol. r, art. 3, p. 93, 1932 (Noumea, New Caledonia).

Materials in the Australian Museum from Funafuti and New Hebrides (Whitley).

Abudefduf notatus (Day).

Glyphidodon notatus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 93, 1932 (Anaho Bay, Nuka Hiva, Marquesas Islands).

Abudefduf curacao (Bloch).

Abudefduf curacao Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Tenibuli and Ugi, Solomons).

Glyphidodon trifasciatus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 67, 1931 (St. Matthias, Ekaliu; east of Long Island, New Guinea; Gazelle Peninsula, Blanche Bay, Matupi).

In the Australian Museum type of *Glyphidodon nigrifrons* Macleay, 75 mm long, from southeast coast of New Guinea; Solomons; Admiralty Islands; Santo, New Hebrides; New Britain; "German New Guinea" (Whitley).

Abudefduf unimaculatus (Cuvier).

Glyphidodon unimaculatus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., p. 67, 1931 (Gazelle Peninsula, Blanche Bay, Vulcan Island west coast).

Abudefduf unimaculatus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 93, 1932 (Noumea, New Caledonia).

Abudefduf dickii (Liénard).

Abudefduf dickii Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Tenibuli, Solomons).

Samoan materials 86 to 100 mm long in the Australian Museum (Whitley).

Abudefduf leucozonus (Bleeker).

Abudefduf leucozona Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 13, Oct.-Dec. 1931 (New Hebrides).

Abudefduf lacrymatus (Quoy and Gaimard).

Abudefduf lacrymatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Tenibuli and Ugi, Solomons). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 13, Feb. 1932 (Fagamalo, Samoa).

New Hebrides material in the Australian Museum (Whitley).

Abudefduf xanthurus (Bleeker).

Solomon Islands material in the Australian Museum (Whitley).

Abudefduf behnii (Bleeker).

Abudefduf behnii Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 11, fig. 4 (young), Aug. 1932 (Suva).

Abudefduf melas (Cuvier).

Abudefduf melas Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Tenibuli, Solomons).

Abudefduf biocellatus (Quoy and Gaimard).

Glyphidodon brownriggi Duncker and Mohr: Naturh. Mus., Hamburg, Mitteil., vol. 44, p. 93, 1931 (St. Matthias, Ekaliu).

Glyphidodon brownriggii Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 93, 1932 (Pago Pago, Samoa).

Abudefduf brownriggi Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 13, Oct.-Dec. 1931 (New Hebrides); vol. 7, no. 1, p. 5, Jan.-Mar. 1932 (Tahiti).

Glyphidodon antjerius Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 67, 1931 (St. Matthias, Ekaliu). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 93, 1932 (Pago Pago, Samoa).

Materials in the Australian Museum from Santa Cruz Islands, Funafuti, Samoa, Santo, and Aneiteum in New Hebrides (Whitley).

Abudefduf cyaneus (Quoy and Gaimard).

Abudefduf taupo Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 13, Oct.-Dec. 1931 (New Hebrides).

New Hebrides material in the Australian Museum (Whitley).

Abudefduf glaucus (Cuvier).

Abudefduf glaucus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 13, Feb. 1932 (Apia).

Materials in the Australian Museum from Samoa, Vanua Lava in Banks Group, Santo and Vila in New Hebrides (Whitley).

Abudefduf leucogaster (Bleeker).*

Glyphisodon leucogaster Bleeker: Verh. Batav. Genootsch. (Labroid.), vol. 21, p. 26, 1846-47 (type loc., Java).

Glyphidodon leucogaster Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 93, 1932 (Bora Bora; Suva).

Abudefduf leucogaster Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 93, 1932 (Noumea, New Caledonia).

Material from Bougainville Island, Solomons, in the Australian Museum (Whitley).

Abudefduf leucopomus (Cuvier).

Samoan material in the Australian Museum (Whitley).

Abudefduf uniocellatus (Quoy and Gaimard).

Abudefduf uniocellatus Fowler: U. S. Nat. Mus., Proc., vol. 80, art. 6, p. 11, 1932 (Ua Huka; Hivaoa, Marquesas Islands). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Hathorne Sound and Ugi, Solomons), p. 13 (New Hebrides); vol. 7, no. 1, p. 5, Jan.-Mar. 1932 (Tahiti). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 11, Aug. 1932 (Suva).

Australian Museum materials from New Hebrides, Samoa, Santa Cruz Islands, Suva (J. S. Callaghan), Fiji (Whitley).

Abudefduf hedleyi (Whitley).*

Glyphisodon hedleyi Whitley: Australian Mus. Rec., vol. 16, pt. 1, p. 20, pl. 1, fig. 5, Oct. 7, 1927 (type loc., Port Moresby, Papua).

Type of *Glyphisodon hedleyi*, 68 mm long, from Dauco Island, New Guinea, in the Australian Museum (Whitley).

Abudefduf filamentosus (Macleay).

Abudefduf metallicus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Kulambangra, fresh water; Auki, fresh water; Tenibuli, Solomons).

Samoan material in the Australian Museum (Whitley).

Abudefduf amabilis (De Vis).

Samoan and New Hebrides materials in the Australian Museum (Whitley).

Abudefduf xanthozona (Bleeker).

Material from Santo, New Hebrides, in the Australian Museum (Whitley).

Abudefduf zonatus (Cuvier).

Abudefduf zonatus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 12, Aug. 1932 (Suva).

In the Australian Museum materials from Samoa, the New Hebrides at Vila, Santo, and Aneiteum, Vaitupu as "moimoi" (demoiselle) in Ellice Islands (Whitley).

Abudefduf bankieri (Richardson).

Abudefduf bankieri Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Tenibuli, Solomons).

Abudefduf bimaculatus (Macleay).*

Glyphisodon bimaculatus Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 271, 1884 (type loc., southeast coast of New Guinea).

Type of *Glyphisodon bimaculatus* Macleay, 38 mm long, in the Australian Museum (Whitley).

Hemiglyphidodon plagiometopon (Bleeker).

Hemiglyphidodon plagiometopon Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Tenibuli, Solomons).

LABRIDAE

Choerodon anchorago (Bloch).

Chaerodon anchorago Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 2, p. 59, 1930 (Oahu) (error).

Choerodon anchorago Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Tenibuli, Solomons).

Chaerops anchorago Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 94, 1932 (Noumea, New Caledonia).

Borodin reports a young one 188 mm long.

Choerodon oligacanthus (Bleeker).*

Crenilabrus oligacanthus Bleeker: Nat. Tijds. Ned. Indie, vol. 2, p. 489, 1851 (type loc., Rio, East Indies).

Chaerops oligacanthus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 94, 1932 (Noumea, New Caledonia).

Lepidaplois perdito (Quoy and Gaimard).

Material from Eromanga, New Hebrides, in the Australian Museum (Whitley).

Lepidaplois bilunulatus (Lacépède).

Lepidaplois bilunulatus Ginsburg: B. P. Bishop Mus., Bull. 107, p. 20, 1933 (Pearl and Hermes Reef).

Hawaiian material in the Australian Museum (Whitley).

Epibulus insidiator (Pallas).

Epibulus insidiator Fowler: U. S. Nat. Mus., Proc., vol. 80, art. 6, p. 11, 1932 (Fakarava). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Tenibuli, Solomons), p. 13 (New Hebrides); vol. 7, no. 1, p. 5, Jan.-Mar. 1932 (Tahiti). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 13, Feb. 1932 (Apia and Fagamalo, Samoa).

Materials in the Australian Museum from Samoa, Port Moresby, and Rabaul in coral patch at 4 fathoms (Whitley).

Labrichthys cyanotaenia Bleeker.

Labrichthys cyanotaenia Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Tenibuli, Solomons).

Labroides dimidiatus (Valenciennes).

Labroides dimidiatus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 69, 1931 (Dörper Point, South East Bay, New Guinea).

New Hebrides materials in the Australian Museum (Whitley).

Anampses dimidiatus Rüppell.

Anampses dimidiatus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 94, 1932 (Raiatea, Society Islands).

Anampses pterophthalmus Bleeker.

Material in the Australian Museum from Engineer Group (Whitley).

Anampses godeffroyi Günther.

Hawaiian materials in the Australian Museum (Whitley).

Anampses cuvier Quoy and Gaimard.

Hawaiian material in the Australian Museum (Whitley).

Anampses caeruleo-punctatus Rüppell.

Anampses coeruleopunctatus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 94, 1932 (Raiatea, Society Islands).

In Australian Museum material from Aneiteum in New Hebrides and Hood Bay, New Guinea (Whitley).

Stethojulis axillaris (Quoy and Gaimard).

Australian Museum materials from Samoa, Santo in New Hebrides, Duke of York Island, Vanua Lava in Banks Group, Pitt Bay in New Guinea (Whitley).

Stethojulis phekadopleura (Bleeker).

Materials in the Australian Museum from Samoa, Vila in New Hebrides, South Cape in New Guinea (Whitley).

Stethojulis albovittata (Bonnaterre).

Material from Vila in New Hebrides in the Australian Museum (Whitley).

Stethojulis casturi (Bleeker).

Material from Epi, Ringdove Bay, New Hebrides, in the Australian Museum (Whitley).

Stethojulis trilineata (Schneider).

Material from Millport Harbor, New Guinea, in the Australian Museum (Whitley).

Hemigymnus fasciatus (Bloch).

Example 100 mm long in the Australian Museum from the Admiralty Islands (Whitley).

Hemigymnus melapterus (Bloch).

Hemigymnus melapterus Herre: Pan-Pac. Research

Inst., Jour., vol. 6, no. 4, p. 13, Oct.-Dec. 1931 (New Hebrides).

Materials in the Australian Museum from Samoa and Port Moresby, New Guinea (Whitley).

Halichoeres centriquadrus (Lacépède).

Halichoeres centriquadrus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 10, Oct.-Dec. 1931 (Moorea, Society Islands). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 13, Feb. 1932 (Apia and Fagamalo, Samoa).

Halicoeres centriquadrus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 94, 1932 (Bora Bora, Society Islands) (error).

Materials in the Australian Museum from Santo, New Hebrides and Port Moresby, New Guinea (Whitley).

Halichoeres scapularis (Bennett).

Halichoeres scapularis Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Tenibuli, Solomons).

Australian Museum materials from New Hebrides and New Britain (Whitley).

Halichoeres trimaculatus (Quoy and Gaimard).

Halichoeres trimaculatus Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 5, Jan.-Mar. 1932 (Tahiti).

Australian Museum materials from New Hebrides, Duke of York Island, Samoa, Solomons, and Hood Bay, New Guinea (Whitley).

Halichoeres leucurus (Walbaum).*

Labrus leucurus Walbaum: Artedi Pisc., vol. 3, p. 249, 1792 (on Gronow: Mus. Ichth., vol. 2, p. 28, no. 183, 1754-56; Zoophylac., no. 240, 1763).

Halichoeres purpurascens Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Tenibuli, Solomons).

Previously known from the East Indies and Philippines.

Halichoeres melanurus (Bleeker).

Platyglossus melanurus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 69, 1931 (Möwe Harbor, south coast New Pomerania).

Halichoeres notopsis (Valenciennes).

Platyglossus notopsis Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 69, 1931 (Dörper Point, South East Bay, New Guinea). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 13, Oct.-Dec. 1931 (New Hebrides).

Materials in the Australian Museum from Apia, Samoa, and Ringdove Bay at Epi, New Hebrides (Whitley).

Halichoeres hoevenii (Bleeker).

Platyglossus hoeveni Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Tenibuli, Solomons).

Halicoeres hoeveni Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 94, 1932 (Raiatea, Society Islands) (error).

Halicoeres hoevenii Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 94, 1932 (Poonaruu Reef, Tahiti) (error).

Materials in the Australian Museum from Vila, New Hebrides, and Hood Bay, New Guinea (Whitley).

Halichoeres miniatus (Valenciennes).

Halichoeres miniatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 13, Oct.-Dec. 1931 (New Hebrides).

Halichoeres margaritaceus (Valenciennes).

Halichoeres opercularis Whitley: Austral. Zool., vol. 4, pt. 4, p. 232, Apr. 1926 (New Hebrides; Samoa).

New Hebrides and Samoan materials in the Australian Museum (Whitley).

Halichoeres nebulosus (Valenciennes).

Halichoeres daedalma Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 5, Jan.-Mar. 1932 (Tahiti).

Australian Museum materials from Samoa and Vila, Santo, New Hebrides, and Vanua Lava in Banks Group (Whitley).

Halichoeres leparensis (Bleeker).

Platyglossus leparensis Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 69, 1931 (Dörper Point, South East Bay, New Guinea; Frederick Wilhelm Harbor).

Halicoeres leparensis Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 94, 1932 (Noumea, New Caledonia).

Halichoeres binotopsis (Bleeker).

Australian Museum materials from Vanua Lava in Banks Group and New Hebrides (Whitley).

Halichoeres argus (Schneider).

Material in the Australian Museum from Malekula, New Hebrides (Whitley).

Halichoeres gymnocephalus (Schneider).

Halichoeres gymnocephalus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Tenibuli, Solomons).

Leptojulis pardalis Kner.

Leptojulis pardalis Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 13, Feb. 1932 (Fagamalo, Samoa).

Coris angulata Lacépède.

Coris angulata Borodin: Vanderbilt Marine Mus., Bull., vol. 1, art. 3, p. 94, 1932 (Raiatea, Society Islands).

Coris aygula Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 5, Jan.-Mar. 1932 (Tahiti).

Type of *Coris cyanea*, 342 mm long, from Port Moresby, New Guinea, and material from Santo, New Hebrides (Whitley).

Coris ballieui Vaillant and Sauvage.

Hawaiian material in the Australian Museum (Whitley).

Coris venusta Vaillant and Sauvage.

Hawaiian material in the Australian Museum (Whitley).

Coris flavovittata (Bennett).

Coris flavovittata Ginsburg: B. P. Bishop Mus., Bull. 107, p. 20, 1933 (Pearl and Hermes Reef).

Hawaiian material in the Australian Museum (Whitley).

Coris gaimard (Quoy and Gaimard).

Coris gaimard Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 94, 1932 (Papeete; Marquesas Islands).

Coris pulcherrima Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 6, Jan.-Mar. 1932 (Tahiti).

Hawaiian material in the Australian Museum (Whitley).

Coris lepomis Jenkins.

Coris lepomis Ginsburg: B. P. Bishop Mus., Bull. 107, p. 20, 1933 (Pearl and Hermes Reef).

Hawaiian material in the Australian Museum (Whitley).

Hologymnosus semidiscus (Lacépède).

Hologymnosus fasciatus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 2, p. 60, 1930 (Hilo, Hawaiian islands).

Material from Port Moresby, New Guinea, in the Australian Museum (Whitley).

Thalassoma quinquevittatus (Lay and Bennett).

Material in the Australian Museum from Pleasant Island, Marshalls (Whitley).

Herre has listed without description or figure (Pan.Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931), from Auki and Tenibuli, Solomons, the nominal *Thalassoma cranci.*

Thalassoma hardwicke (J. W. Bennett).

Thalassoma hardwicke Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Tenibuli, Solomons), p. 13 (New Hebrides). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 12, Aug. 1930 (Suva).

Thalassoma harwicke Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 5, Jan.-Mar. 1932 (Tahiti) (error).

Thalassoma dorsale Pietschmann: B. P. Bishop Mus., Bull. 73, p. 18, 1930 (Guam).

Materials in the Australian Museum from Solomons, Samoa, Tongatabu, Admiralty Islands, Vila in the New Hebrides (Whitley).

Thalassoma schwanefeldii (Bleeker).

Thalassoma schwanenfeldi Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Ugi, Solomons).

Thalassoma lunare (Linnaeus).

Thalassoma lunare Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Hathorne Sound, Solomons). Giltay: Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, pt. 3, p. 77, 1933 (Manokwari, New Guinea).

Australian Museum materials from Funafuti and Port Moresby, New Guinea (Whitley).

Thalassoma umbrostygma (Rüppell).

Thalassoma umbrostygma Fowler: U. S. Nat. Mus., Proc., vol. 80, art. 6, p. 11, 1932 (Ua Huka, Marquesas); vol. 81, art. 8, p. 5, 1932 (Niuafoou Island).

Thalassoma umbrostigma Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 5, Jan.-Mar. 1932 (Tahiti). Ginsburg: B. P. Bishop Mus., Bull. 107, p. 20, 1933 (Pearl and Hermes Reef).

Thalassoma purpureum (part) Pietschmann: B. P. Bishop Mus., Bull. 73, p. 18, 1930 (Pearl and Hermes Reef) (discussion).

New Hebrides materials, 38 to 68 mm long, in the Australian Museum (Whitley).

Thalassoma purpureum (Linnaeus).

Thalassoma purpureum Pietschmann: B. P. Bishop Mus., Bull. 73, p. 18, 1930 (Pearl and Hermes Reef). Ginsburg: B. P. Bishop Mus., Bull. 107, p. 20, 1933 (Pearl and Hermes Reef).

Materials in the Australian Museum from Ontong Java, also Vaitupu as "ulaula" and "lape" (parrot fish) in Ellice Islands (Whitley).

Thalassoma trilobata (Lacépède).

Materials from Ontong Java, Hawaiian islands, Aneiteum, New Hebrides (Whitley).

Thalassoma lutescens (Lay and Bennett).

Thalassoma lutescens Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 5, Jan.-Mar. 1932 (Tahiti).

Thalassoma melanochir (Bleeker).

Material in Australian Museum from Pleasant Island, Marshalls (Whitley).

Thalassoma duperrey (Quoy and Gaimard).

Thalassoma duperrey Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 2, p. 60, 1930 (Oahu).

Hawaiian material in the Australian Museum (Whitley).

Thalassoma ballieui (Vaillant and Sauvage).

Thalassoma bailieui Ginsburg: B. P. Bishop Mus., Bull. 107, p. 20, 1933 (Pearl and Hermes Reef).

Hawaiian material in the Australian Museum (Whitley).

Thalassoma amblycephalus (Bleeker).

Thalassoma amblycephalus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 94, 1932 (Noumea, New Caledonia).

Gomphosus varius Lacépède.

Material from Hood Bay, New Guinea, in Australian Museum (Whitley).

Gomphosus tricolor Quoy and Gaimard.

Materials in the Australian Museum from Hawaiian islands, New Britain, and Pitt Bay, Moresby Islands (Whitley).

Gomphosus coeruleus Lacépède.*

Gomphosus coeruleus Lacépède: Hist. Nat. Poiss., vol. 3, pp. 100, 101, fig. 1, 1802 (type loc., no locality = Mauritius; on Commerson).

Material in the Australian Museum from Aneiteum, New Hebrides (Whitley). Previously known from Mauritius, Bourbon, Ceylon, Cocos-Keeling Islands and the East Indies.

Cheilio inermis (Forskål).

Cheilio inermis Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 2, p. 60, 1930 (Honolulu; Oahu).

Australian Museum materials from Hawaiian islands, Samoa, Admiralty Islands, Port Moresby, and New Guinea (Whitley).

Cirrhilabrus solorensis Bleeker.

Material in the Australian Museum from Pitt Bay, Moresby Island (Whitley).

Pseudocheilinus hexataenia (Bleeker).

Pseudocheilinus hexataenia Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 5, Jan.-Mar. 1932 (Tahiti).

Material in the Australian Museum from Duke of York Island (Whitley).

Cheilinus bimaculatus Valenciennes.

Hawaiian material in the Australian Museum (Whitley).

Cheilinus trilobatus Lacépède.

Cheilinus trilobatus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 68, 1931 (St. Matthias, Ekaliu). Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 5, Jan.-Mar. 1932 (Tahiti). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 13, Feb. 1932 (Pago Pago).

Samoan material in the Australian Museum (Whitley).

Cheilinus fasciatus (Bloch).

Cheilinus fasciatus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 68, 1931 (St. Matthias, Ekaliu; Mowe Harbor, south coast New Pomerania; Liebliche Island, southwest coast). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Tenibuli, Solomons). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 14, Feb. 1932 (Fagamalo, Samoa). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 94, 1932 (Suva).

Materials in the Australian Museum from Ontong Java, Samoa, Funafuti, Solomons, and Port Moresby, New Guinea (Whitley).

Cheilinus undulatus Rüppell.

Australian Museum material from Port Moresby, New Guinea (Whitley).

Cheilinus diagrammus (Lacépède).

Cheilinus diagrammus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 13, Oct.-Dec. 1931 (New Hebrides).

Cheilinus radiatus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 68, 1931 (Möwe Harbor, south coast New Pomerania).

Materials in the Australian Museum from New Hebrides, southeast New Guinea, and Port Moresby (Whitley).

Cheilinus kitlitzii Valenciennes.

Material in the Australian Museum from the Solomons (Whitley).

Cheilinus oxyrhynchus Bleeker.

Cheilinus oxyrhynchus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Tenibuli, Solomons).

Cheilinus chlorourus (Bloch).

Cheilinus chlorourus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 10, Oct.-Dec. 1931 (Moorea, Society Islands), p. 13 (New Hebrides). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 94, 1932 (Papeete, Tahiti).

Australian Museum materials from Apia, Samoa, and the Solomons (Whitley).

Novaculichthys macrolepidotus (Bloch).

Material from Hood Bay, New Guinea, in the Australian Museum (Whitley).

Novaculichthys taeniourus (Lacépède).

Novaculichthys taeniurus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 2, p. 60, 1930 (Marshall Islands) (error); vol. 1, art. 3, p. 94, 1932 (Raiatea, Society Islands) (error).

Novacula taeniurus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 68, 1931 (St. Matthias, Ekaliu).

Material in the Australian Museum from Samoa, New Hebrides, and Port Moresby, New Guinea (Whitley).

Hemipteronotus pentadactylus (Linnaeus).

Hawaiian material in the Australian Museum (Whitley).

Hemipteronotus melanopus (Bleeker).

Hawaiian material in the Australian Museum (Whitley).

Iniistius pavo (Valenciennes).

Iniistius pavoninus McCulloch: Linn. Soc. New South Wales, Proc., vol. 46, pt. 4, p. 470, Nov. 30, 1921 (Honolulu).

Australian Museum material from Hawaiian islands (Whitley).

Iniistius niger (Steindachner).

Hawaiian material in the Australian Museum (Whitley).

CALLYODONTIDAE

Scarichthys auritus (Valenciennes).

Australian Museum materials from the New Hebrides, Fife Bay, and Hood Bay, New Guinea (Whitley).

Borodin gives a record "*Scarus cretensis* C. V." (Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 95, 1932) from Noumea, New Caledonia. This is surely erroneous and may have been intended for either the present or the following species?

Scarichthys caeruleopunctatus (Rüppell).

Material in the Australian Museum from Port Moresby, New Guinea (Whitley).

Scaridea zonarcha Jenkins.

Scaridea aerosa Pietschmann: B. P. Bishop Mus., Bull. 73, p. 19, 1930 (Honolulu).

Leptoscarus brachysomus (Bleeker).

Material from Port Moresby, New Guinea, in the Australian Museum (Whitley).

Leptoscarus vaigiensis (Quoy and Gaimard).

Materials from Hawaiian islands and Port Moresby, New Guinea (Whitley).

Callyodon perspicillatus (Steindachner).

Callyodon perspicillatus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 14, Feb. 1932 (note).

Scarus kraussi E. K. Jordan: U. S. Nat. Mus., Proc., vol. 66, art. 33, p. 30, pl. 2, fig. 1, 1925 (type loc., Honolulu).

Callyodon erythrodon (Valenciennes).

Callyodon erythrodon Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 9, Oct.-Dec. 1931 (Tenibuli, Solomons), p. 10 (Moorea, Society Islands), p. 13 (New Hebrides). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 95, 1932 (Borabora, Society Islands).

Australian Museum materials from Samoa and Port Moresby, New Guinea (Whitley).

Callyodon moensi (Bleeker).

Pseudoscarus aff. *moensi* Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 69, 1931 (St. Matthias, Ekaliu).

Callyodon sordidus (Forskål).

Callyodon sordidus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 12, Aug. 1932 (Suva).

Callyodon abacurus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Tenibuli, Solomons). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 95, 1932 (Raiatea, Society Islands).

Callyodon troscheli Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 5, Jan.-Mar. 1932 (Tahiti).

Australian Museum material from Funafuti (Whitley).

Callyodon quoyi (Valenciennes).

Callyodon quoyi Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 9, Oct.-Dec. 1931 (Hathorne Sound and Tenibuli, Solomons).

Callyodon bataviensis (Bleeker).

Material from Funafuti in the Australian Museum (Whitley).

Callyodon forsteri (Valenciennes).

Callyodon forsteri Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 14, Feb. 1932 (Fagamalo, Samoa).

Hawaiian material in the Australian Museum (Whitley).

Callyodon mutabilis Gray.

Material in the Australian Museum from Funafuti (Whitley).

Callyodon microcheilos (Bleeker).

Callyodon microcheilus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 95, 1932 (Raiatea, Society Islands).

Callyodon microrhinos (Bleeker).

Callyodon ultramarinus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 95, 1932 (Borabora, Society Islands).

Callyodon pulchellus (Rüppell).

Material in the Australian Museum from Funafuti (Whitley).

Callyodon dimidiatus (Bleeker).

Callyodon dimidiatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Hathorne Sound, Solomons).

Callyodon spinus (Kner).

Callyodon spinus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 14, Feb. 1932 (Samoa).

Callyodon frenatus (Lacépède).

Callyodon frenatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 9, Oct.-Dec. 1931 (Tenibuli, Solomons).

Callyodon caudofasciatus (Günther).

Callyodon zonularis Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 9, Oct.-Dec. 1931 (Tenibuli and Shortland Island, Solomons).

Callyodon oviceps (Valenciennes).

Callyodon oviceps Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 14, Feb. 1932 (Fagamalo, Samoa).

Materials in the Australian Museum from Samoa and Amboin, New Hebrides (Whitley).

Callyodon pectoralis (Valenciennes).

Pseudoscarus pectoralis Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 69, 1931 (Liebliche Island, New Pomerania).

Callyodon pectoralis Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 9, Oct.-Dec. 1931 (Hathorne Sound and Tenibuli, Solomons).

Callyodon lasulinus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 95, 1932 (Raiatea, Society Islands) (error).

Callyodon balinensis (Bleeker).

Callyodon balinensis Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Tenibuli, Solomons).

Samoan material in the Australian Museum (Whitley).

Callyodon blochii (Valenciennes).

Callyodon blochii Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 94, 1932 (Raiatea, Society Islands).

Pseudoscarus chrysopoma Borodin: Vanderbilt Mar., Mus., Bull., vol. 1, art. 3, p. 95, 1932 (New Caledonia).

Callyodon rubroviolaceus (Bleeker).

Callyodon ruberrimus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 94, 1932 (Papeete, Tahiti).

Callyodon upolensis Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 95, 1932 (Borabora, Society Islands).

Samoan material in the Australian Museum (Whitley).

Callyodon dubius (Bennett).

Callyodon dubius Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 8, Oct.-Dec. 1931 (Tenibuli, Solomons). Fowler: B. P. Bishop Mus., vol. 9, no. 18, p. 14, Feb. 1932 (Apia and Pago Pago, Samoa); vol. 9, no. 20, p. 12, Aug. 1932 (Suva). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 95, 1930 (Apia, Samoa).

Scarus galena E. K. Jordan: U. S. Nat. Mus., Proc., vol. 66, art. 33, p. 32, 1925 (type loc., Honolulu).

Callyodon bennetti Pietschmann: B. P. Bishop Mus., Bull. 73, p. 19, 1930 (Honolulu).

Callyodon globiceps (Valenciennes).

Callyodon globiceps Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 5, Jan.-Mar. 1932 (Tahiti).

Callyodon nuchipunctatus (Valenciennes).

Materials from Amboin, New Hebrides, and Port Moresby, New Guinea, in the Australian Museum (Whitley).

Callyodon ghobban (Forskål).

Material from Port Moresby in the Australian Museum (Whitley).

Callyodon guttatus (Schneider).

Callyodon guttatus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 14, Feb. 1932 (Samoa).

Material from Funafuti in the Australian Museum (Whitley).

Callyodon bicolor (Rüppell).

Callyodon bicolor Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 95, 1932 (Borabora, Society Islands).

ELEOTRIDAE

Bostrichthys sinensis (Lacépède).

Bostrichthys sinensis Herre: Gobies of Philippines, p. 43, pl. 3, fig. 3, 1927 (Samoa).

Guavina gyrinoides (Bleeker).

Material from Strickland River, New Guinea, in the Australian Museum (Whitley).

Oxyeleotris lineolatus (Steindachner).

Type of *Eleotris immaculatus* Macleay, 480 mm long, from Keremma River, in the Australian Museum (Whitley).

Ophiocara aporos (Bleeker).

Materials from Fiji, Solomons, and Gazelle Peninsula, New Britain, in the Australian Museum (Whitley).

Ophiocara hoedtii (Bleeker).

Ophiocara hoedti Giltay: Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 91, 1933 (Sorong, New Guinea).

Ophiocara ophiocephalus (Valenciennes).

Australian Museum materials from Fiji, Santo in New Hebrides, and Normanby Island in fresh water (Whitley).

Ophiocara macrolepidotus (Bloch).

Ophiocara porocephalus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 13, Oct.-Dec. 1931 (New Hebrides in fresh water).

Eleotris fusca (Schneider).

Eleotris fusca Herre: Gobies of Philippines, p. 30, pl. 2, fig. 1, 1927 (Guam); Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 10, Oct.-Dec. 1931 (Moorea, Society Islands); p. 13 (fresh waters New Hebrides); vol. 7, no. 1, p. 5, Jan.-Mar. 1932 (fresh waters Tahiti). Fowler: U. S. Nat. Mus., Proc., vol. 80, art. 6, p. 12, 1932 (Hivaoa; Fatuhiva, Marquesas); B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 14, Feb. 1932 (Apia); vol. 9, no. 20, p. 12, Aug. 1932 (Suva); vol. 9, no. 25, p. 6, 1932 (Papuaei Valley, Hivaoa and Omoa Valley, Fatuhiva, Marquesas Islands).

Eleotris sandwicensis Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 2, p. 60, 1930 (Honolulu).

Australian Museum materials from Hawaiian islands, Samoa, Santo in New Hebrides, Narokorokoyawa in Fiji, Oubatch in New Caledonia, and Walip River, New Guinea (Whitley).

Eleotris melanosoma Bleeker.

Eleotris melanosoma Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 9, Oct.-Dec. 1931 (Auki, Solomons, in fresh water), p. 13 (New Hebrides, fresh water).

Gobiomorphus eugenius (Jordan and Evermann).

Australian Museum material from Suva, Fiji and Santo, New Hebrides (Whitley).

Butis amboinensis (Bleeker).

Butis amboinensis Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 9, Oct.-Dec. 1931 (Auki, Kulambangra and Ugi, Solomons, all in fresh water).

Materials from Ugi, Solomons, and Strickland River, New Guinea, latter recorded as *Eleotris butis* by Ramsay and Ogilby (Whitley).

Asterropterix semipunctatus Rüppell.

Asterropteryx semipunctatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 13, Oct.-Dec. 1931 (New Hebrides); vol. 7, no. 1, p. 5, Jan.-Mar. 1932 (Tahiti).

Materials in the Australian Museum from Suva, Fiji, New Hebrides, and Samoa (Whitley).

Eviota abax (Jordan and Snyder).*

Asterropteryx abax Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 24, p. 40, fig. 2, 1901 (type loc., Misaki, Sagami).

Asternopteryx abax Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 95, 1932 (Raiatea, Society Islands) (error).

Eciota afelei Jordan and Seale.

Eviota afelei Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 10, Oct.-Dec. 1931 (Moorea, Society Islands); vol. 7, no. 1, p. 5, Jan.-Mar. 1932 (Tahiti).

Eviota distigma Jordan and Seale.

Eviota distigma Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 395, Jan.-Mar. 1932 (Tahiti).

Eviota epiphanes Jenkins.

Eviota smaragdus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 14, Oct.-Dec. 1931 (New Hebrides).

Eviota viridis (Waite).

Eviota viridis Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 14, Oct.-Dec. 1931 (New Hebrides).

Materials in the Australian Museum from Vila and Santo, New Hebrides, and Samoa, last as *Eviota zonurus* (Whitley).

In Bernice P. Bishop Museum two from Rarotonga, 17 to 33 mm long, collected by Wilder and Parks in 1929. Approaches Jordan and Seale's figure of *Eviota zonura*, though the dark caudal spot not darker than the dark bands on the under surface of the tail.

Encaeura evides Jordan and Hubbs.*

Encaeura evides Jordan and Hubbs: Carnegie Mus., Mem., vol. 10, no. 2, p. 303, pl. 11, fig. 2, June 27, 1925 (type loc., Wakanoura, Japan). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 14, Oct.-Dec. 1931 (New Hebrides).

Hypseleotris cyprinoides (Valenciennes).

Materials in the Australian Museum from Apia, Samoa, and Fiji (Whitley).

Hypseleotris diadematus (Rüppell).

Australian Museum material from Hog Harbor at Santo, New Hebrides (Whitley).

Valenciennea strigata (Broussonet).

Material in the Australian Museum from the New Hebrides (Whitley).

Valenciennea violifera Jordan and Seale.

Materials in the Australian Museum from Samoa, New Hebrides, Duke of York Island, and Bougainville Island, Solomons (Whitley).

Valenciennea muralis (Valenciennes).

Cotypes of *Valenciennea aruensis*, 112 to 118 mm long, from the Aru Islands (Whitley).

GOBIIDAE

Gobiodon verticalis Alleyne and Macleay.

Material in the Australian Museum from Dauco Island, living among branches of coral stalks (Whitley).

Gobiodon rivulatus (Rüppell).

Gobiodon rivulatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 14, Oct.-Dec. 1931 (New Hebrides).

Gobiodon quinquestrigatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 14, Oct.-Dec. 1931 (New Hebrides). Giltay: Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 98, fig. 29 (variation), 1933 (Sorong, New Guinea).

Material in the Australian Museum from Dauco Island (Whitley).

Gobiodon citrinus (Rüppell)

Gobiodon citrinus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 15, Feb. 1932 (Samoa and Pago Pago). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 95, 1932 (Suva, Fiji).

Materials in the Australian Museum from Samoa, New Hebrides, and Howla Island, Solomons (Whitley).

Gobiodon erythrospilus Bleeker.*

Gobiodon erythrospilus Bleeker: Neerl. Sci. Nat. Harlem, Arch., vol. 10, p. 123, 1875 (type loc., Batu; Cocos; Sumbawa; Solor; Timor; Celebes; Buru; Goram). Giltay: Mus. Roy. Soc. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 100, 1933 (Sorong, New Guinea).

Paragobiodon echinocephalus (Rüppell).

Paragobiodon echinocephalus Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 5, Jan.-Mar. 1932 (Tahiti).

Australian Museum materials from Duke of York Island, Solomons in Tenibuli Harbor at Ysabel, and Bougainville Island, and "German New Guinea" (Whitley).

Sicyopterus stimpsoni (Gill).

Sicyopterus stimpsoni Pietschmann: B. P. Bishop Mus., Bull. 73, p. 20, 1930 (Waiahole, Oahu).

In Bernice P. Bishop Museum one 108 mm long from fresh water stream in Manoa Valley, Oahu, Dec. 1928, by Dr. Edmondson.

Sicyopterus taeniurus (Günther).

Papenua pugnans Herre: Pan-Pac. Research Inst. Jour., vol. 6, no. 4, p. 10, Oct.-Dec. 1931 (Moorea, Society Islands); vol. 7, no. 1, p. 6, Jan.-Mar. 1932 (fresh waters of Tahiti).

In the Australian Museum material from Narokorokoyawa, Fiji (Whitley).

Sicyopterus marquesensis Fowler.*

Sicyopterus marquesensis Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 25, p. 7, fig. 3, 1932 (type loc., 1,700 feet Tohetaivau, Omoa Valley, Fatuhiva, Marquesas Islands).

Microsicydium elegans (Steindachner).

Stiphodon elegans Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 10, Oct.-Dec. 1931 (fresh water of Moorea, Society Islands). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 25, p. 8, fig. 4 (male and female), 1932 (350 feet, Vai Tuoru River, Papenoo Valley, Tahiti; Taiohae, Nukuhiva, Marquesas Islands; 300 feet, Omoa Valley, Fatuhiva; Hakahetau River, Uapou).

Bryanina inana Fowler.*

Bryanina inana Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 25, p. 10, fig. 5, 1932 (type loc., 350 feet, Vai Tuoru River, Papenoo Valley, Tahiti, Society Islands).

Bathygobius fuscus (Rüppell).

Bathygobius fuscus Herre: Gobies of the Philippines, p. 113, pl. 8, fig. 2, 1927 (Samoa, South Pacific, Marcus, and Hawaiian islands); Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 9, Oct.-Dec. 1931 (Kulambangra in fresh water, Solomons), p. 14 (New Hebrides); vol. 7, no. 1, p. 5, Jan.-Mar. 1932 (Tahiti). Fowler: U. S. Nat. Mus., Proc., vol. 81, art. 8, p. 5, 1932 (Niuafoou Island).

Materials in the Australian Museum from Apia in Samoa, Suva in Fiji, Santo and Vate in the New Hebrides, Ocean Island, Hawaiian islands, Tulagi in Solomons (Whitley).

Gnatholepis puntangoides (Bleeker).

Gobius puntangoides Bleeker: Nat. Tijds. Ned. Indie, vol. 5, p. 242, 1853 (type loc., Amboina, in rivers; Wahai, Ceram, in sea.

Gnatholepis puntangoides Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 9, Oct.-Dec. 1931 (Hathorne Sound and Kulambangra Island, Solomons, in fresh water).

Gobius puntang (not Bleeker 1851) Bleeker: Nat. Tijds. Ned. Indie, vol. 3, p. 692, 1852.

Type of *Gobius maculipinnis* Macleay, 88 mm long, in the Australian Museum, also Normanby Island material from fresh water (Whitley).

Gnatholepis puntang (Bleeker) in "Fishes of Oceania" thus changes to the above.

Gnatholepis anjerensis (Bleeker).

Materials in the Australian Museum from Samoa, Vila in the New Hebrides, and Tulagi in the Solomons.

Herre mentions the following, without descriptions or figures:

Gnatholepis corlettei Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 14, Oct.-Dec. 1931 (type loc., Bushman's Bay, Malekula, New Hebrides).

Gnatholepis gemmeus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 14, Oct.-Dec. 1931 (type loc., New Hebrides).

Glossogobius concavifrons (Ramsay & Ogilby).

Gobius concavifrons Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 404, 1928 (compiled).

Type of *Gobius concavifrons* Ramsay and Ogilby, from Strickland River, New Guinea, in the Australian Museum (Whitley).

Glossogobius biocellatus (Valenciennes).

Glossogobius biocellatus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 15, Feb. 1932 (Apia).

Glossogobius circumspectus (Macleay).*

Gobius circumspectus Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 267, 1883 (type loc., Milne Bay, New Guinea, in fresh water).

Glossogobius giuris (not Buchanan-Hamilton) Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 402, 1928 (part; on Macleay and McCulloch).

Type of *Gobius circumspectus* Macleay from Milne Bay, New Guinea, in the Australian Museum (Whitley).

Gobius ornatus Rüppell.

Gobius ornatus Fowler: U. S. Nat. Mus., Proc., vol. 80, art. 6, p. 12, 1932 (Eiao, Marquesas Islands). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 14, Oct.-Dec. 1931 (New Hebrides).

In the Australian Museum materials from New Britain, Santo and Vila in the New Hebrides, Vanua Lava in Banks Group (Whitley).

Herre has given a name for a new goby, without description or figure, as *Macgregorella santa* (Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 9, Oct.-Dec. 1931) from Tenibuli, Solomons, and Hog Harbor, Espiritu Santo Island, New Hebrides (op. cit., p. 14).

Vaimosa notospila (Günther).

Material as *Mugilogobius (Vaimosa) fontinalis* from Samoa, in the Australian Museum (Whitley).

Opua nephodes E. K. Jordan.*

Opua nephodes E. K. Jordan: U. S. Nat. Mus., Proc., vol. 66, art. 33, p. 66, pl. 2, fig. 2, 1925 (type loc., Honolulu). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 15, Feb. 1932 (reference).

This species omitted from "Fishes of Oceania".

Callogobius hasseltii (Bleeker).

New Hebrides material in the Australian Museum (Whitley).

Callogobius sclateri (Steindachner).

Callogobius sclateri Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 14, Oct.-Dec. 1931 (New Hebrides).

Materials in the Australian Museum from Suva, Fiji, Hog Harbor in the New Hebrides, and Tulagi in the Solomons (Whitley).

Chonophorus guamensis (Valenciennes).

Materials in the Australian Museum from Waimea River, Hawaii, and Narokorokoyawa, Fiji (Whitley).

Chonophorus ocellaris (Broussonet).

Chonophorus ocellaris Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 6, Jan.-Mar. 1932 (fresh water of Tahiti).

Material from Apia, Samoa, in the Australian Museum (Whitley).

Chonophorus genivittatus (Valenciennes).

Chonophorus genivittatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 10, Oct.-Dec. 1931 (fresh water, Moorea, Society Islands); vol. 7, no. 1, p. 5, Jan.-Mar. 1932 (Tahiti).

Material from Hawaii in the Australian Museum (Whitley).

Rhinogobius nebulosus (Forskål).

Australian Museum material from Vila, New Hebrides (Whitley).

Herre has published the following new names, without description or figures:

Rhinogobius aterrimus (Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 9, Oct.-Dec. 1931, type loc., Auki, Solomon Islands, in fresh water).

Rhinogobius malekulae (Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 14, Oct.-Dec. 1931, type loc., Bushman's Bay, Malekula Island, New Hebrides).

Rhinogobius baliuroides (Bleeker).*

Gobius baliuroides Bleeker: Verh. Batav. Genoot. (Blenn. Gob.), vol. 22, p. 26, 1849 (type loc., Sumanap, eastern Madura, in tidal).

Rhinogobius baliuroides Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 14, Oct.-Dec. 1931 (New Hebrides).

Previously known from the East Indies and Philippines.

Rhinogobius neophytus (Günther).

Rhinogobius neophytus Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 5, Jan.-Mar. 1932 (Tahiti).

Drombus tutuilae Jordan and Seale.

New Hebrides material in the Australian Museum (Whitley).

Vailima stevensoni Jordan and Seale.

Materials from Samoa in the Australian Museum (Whitley).

Amblygobius phalaena (Valenciennes).

Materials in the Australian Museum from Aneiteum and Vila in the New Hebrides and Bougainville Island in the Solomons (Whitley).

Amblygobius insignis Seale.*

Amblygobius insignis Seale: Philippine Jour. Sci., vol. 5, p. 116, pl. 2, fig. 2, 1910 (type loc., Polillo). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 9, Oct.-Dec. 1931 (Hathorne Sound, Solomons).

Herre publishes, without description or figure, *Amblygobius myersi* (Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 9, Oct.-Dec. 1931, type loc., Hathorne Sound, Solomons).

Cryptocentrus leucostictus (Günther).

Material from Tonga in the Australian Museum (Whitley).

Zonogobius semidoliatus (Valenciennes).

Zonogobius semidoliatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 14, Oct.-Dec. 1931 (New Hebrides); vol. 7, no. 1, p. 5, Jan.-Mar. 1932 (Tahiti). Fowler: U. S. Nat. Mus., Proc., vol. 81, art. 8, p. 5, 1932 (Niuafoou Island).

In Bernice P. Bishop Museum two examples, 16 to 19 mm long, from Rarotonga in 1929, by Wilder and Parks.

Materials in the Australian Museum from Samoa, New Hebrides, Suva in Fiji, and Tulagi in the Solomons (Whitley).

Gobiichthys papuensis (Valenciennes).

Gobiichthys lonchotus Ginsburg: B. P. Bishop Mus., Bull. 107, p. 20, 1933 (Pearl and Hermes Reef).

Periophthalmus koelreuteri (Pallas).

Periophthalmus koelreuteri argentilineatus Giltay: Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 100, 1933 (Sorong, New Guinea).

Periophthalmus koelreuteri Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 12, Aug. 1932 (Suva).

Periophthalmus barbarus (Linnaeus).

Periophthalmus barbarus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 9, Oct.-Dec. 1931 (Auki, Solomons), p. 14 (New Hebrides).

Materials in the Australian Museum from Samoa, Peu in Vanikoro, and Bougainville Island in the Solomons (Whitley).

Apocryptodon fasciatus (Macleay).

Types of *Apocryptes fasciatus* Macleay, 87 to 100 mm long, in the Australian Museum, from southeast New Guinea (Whitley).

Parapocryptes serperaster (Richardson).*

Apocryptes serperaster Richardson: Ichth. China and Japan, p. 206, 1846 (type loc., Macao).

Apocryptes serperastes Borodin: Vanderbilt Mar., Mus., Bull., vol. 1, art. 3, p. 96, 1932 (Noumea, New Caledonia) (error).

Known from India, Malaya, China, and Melanesia.

Paragoboides grandoculis Kendall and Goldsborough.*

Paragoboides grandoculis Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 324, pl. 6, fig. 2, 1911 (type loc., Arnho Atoll, Marshall Islands). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 15, Feb. 1932 (reference).

Parapobiodon echinocephalus (not Rüppell) Fowler: B. P. Bishop Mus., Mem., vol. 10, p. 399, 1928 (part; on Kendall and Goldsborough).

This species wrongly merged with *Paragobiodon echinocephalus* in "Fishes of Oceania".

ECHENEIDAE

Echeneis albescens Schlegel.

Echeneis albescens Fowler: U. S. Nat. Mus., Proc., vol. 80, art. 6, p. 12, 1932 (Shavy Bay, Ua Huka, Marquesas, on *Manta birostris*).

Echeneis remora Linnaeus.

Materials in the Australian Museum from New Hebrides, Pitcairn Island, and Bougainville Island in the Solomons (Whitley).

Leptecheneis naucrates (Linnaeus).

Echeneis naucrates Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 2, p. 61, 1930 (Caroline Islands). Duncker and Mohr: Naturh. Zool. Mus. Hamburg, Mitteil., vol. 44, p. 70, 1931 (Simpson Harbor, New Pomerania). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 96, 1932 (Noumea, New Caledonia).

Leptecheneis naucrates Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 14, Feb. 1932 (Apia, Samoa).

Australian Museum materials from Samoa, Funafuti, Suwarow Island, Gilberts, Vila in the New Hebrides, Hiwo Reef on northeast Ysabel in the Solomons, and Hood Bay, New Guinea (Whitley).

CALLIONYMIDAE

Calliurichthys decoratus Gilbert.

Calliurichthys decoratus Ginsburg: B. P. Bishop Mus., Bull. 107, p. 20, 1933 (Pearl and Hermes Reef).

Synchiropus microps (Günther).

Callionymus microps Whitley: Austral. Mus., Rec., vol. 16, no. 1, p. 27, Oct. 7, 1927 (New Hebrides).

New Hebrides material in the Australian Museum, 18 to 50 mm long (Whitley).

PARAPERCIDAE

Parapercis cylindrica (Bloch).

Percis cylindrica Gray: Descr. Cat. Spec. Roy. College Surg., p. 21, 1859 (Tongataboo).

Parapercis cylindrica Whitley: Austral. Zool., vol. 4, pt. 4, p. 233, April 1926 (Friendly Islands).

Friendly Islands material in the Australian Museum (Whitley).

Parapercis hexophthalma (Cuvier).

Percis cancellata Gray: Descr. Cat. Spec. Roy. College Surg., p. 21, 1859 (Fiji).

Parapercis tetracanthus (Bleeker).

Material in the Australian Museum from Ringdove Bay on Epi, New Hebrides (Whitley).

Parapercis schauinslandii (Steindachner).

Hawaiian material in the Australian Museum (Whitley).

BLENNIIDAE

Clinus perspicillatus Valenciennes.*

Clinus perspicillatus Valenciennes: Hist. Nat. Poiss., vol. 11, p. 274, July 1836 (type loc., Port Western, Victoria).

Material in the Australian Museum from Gilbert Islands (Whitley).

Giffordella corneliae Fowler.*

Giffordella corneliae Fowler: U. S. Nat. Mus., Proc., vol. 80, art. 6, p. 14, fig. 4, 1932 (type loc., Nukuhiva, Marquesas Islands).

Gray mentions *Blennius pholis* Linnaeus (Descr. Cat. Spec. Roy. College Surg., p. 43, 1859) from the Fiji Islands, surely a wrong identification for some tropical blenny.

Enneapterygius hemimelas (Kner and Steindachner).

Enneapterygius atriceps Pietschmann: B. P. Bishop Mus., Bull. 73, p. 20, 1930 (Waikiki Reef, Oahu).

Enneapterygius minutus (Günther).

Enneapterygius minutus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 14, Oct.-Dec. 1931 (New Hebrides).

Samoan material in the Australian Museum (Whitley).

Herre publishes, without description or figure, *Enneapterygius punctulatus* (Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 14, Oct.-Dec. 1931, type loc., New Hebrides).

Aspidontus maroubrae (Ogilby).*

Macrurrhynchus maroubrae Ogilby: Linn. Soc. New South Wales, Proc., vol. 21, pt. 2, p. 137, Sept. 23, 1896 (type loc., Maroubra, New South Wales).

Aspidontus maroubrae Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 96, 1932 (Anaho Bay, Nukuhiva, Marquesas).

New Hebrides material in the Australian Museum (Whitley).

Herre publishes, without description or figure, *Petroscirtes kulambangrae* (Pan-Pac. Inst., Jour., vol. 6, no. 4, p. 9, Oct.-Dec. 1931) (type loc., Kulambangra Island, Solomons, in fresh water).

Cirripectes variolosus (Valenciennes).

Salarias variolosus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 97, 1932 (Venus Point Reef, Tahiti; Raiatea, Society Islands).

Materials in the Australian Museum from Hapai in the Friendly Islands and Aneiteum, Santo, New Hebrides (Whitley).

Salarias saliens (Forster).

Salarias saliens Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 14, Oct.-Dec. 1931 (New Hebrides). Fowler: U. S. Nat. Mus., Proc., vol. 81, art. 8, p. 6, 1932 (Niuafoou).

Salarias tridactylus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 97, 1932 (Anaho Bay, Nukuhiva, Marquesas).

New Hebrides materials, 50 to 56 mm long, in the Australian Museum (Whitley).

Salarias sindensis Day.*

Salarias sindensis Day: Zool. Soc. London, Proc., p. 263, 1888 (type loc., Kurrachee in Sind).

Salarias sindensis Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 97, 1932 (Anaho Bay, Nukuhiva, Marquesas Islands) (error).

Salarias nitidus Günther.

Material in the Australian Museum from Santo and Aneiteum in the New Hebrides, and Samoa (Whitley).

Salarias fasciatus (Bloch).

Salarias fasciatus Pietschmann: B. P. Bishop Mus., Bull. 73, p. 21, 1930 (Suva). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 97, 1932 (Pago Pago, Samoa).

Materials in the Australian Museum from Samoa, Fiji, New Caledonia, New Hebrides, Friendly Islands, Vanua Lava in the Banks Group (Whitley).

Salarias fuscus Rüppell.

Salarias fuscus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 12, Aug. 1932 (Suva).

Friendly Islands material in the Australian Museum (Whitley).

Salarias marmoratus (Bennett).

Blennius marmoratus Gray: Descr. Cat. Spec. Roy. College Surg., p. 43, 1859 (Pacific Ocean and Sumatra).

Salarias marmoratus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 97, 1932 (Fare Bay, Huahine Island, Society Islands). Ginsburg, B. P. Bishop Mus., Bull. 107, p. 20, 1933 (Pearl and Hermes Reef).

In the Australian Museum materials from Laysan, New Hebrides, and Funafuti (Whitley).

Salarias guttatus Valenciennes.

Salarias guttatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 14, Oct.-Dec. 1931 (New Hebrides).

Salarias kellersi Fowler.*

Salarias kellersi Fowler: U. S. Nat. Mus., Proc., vol. 81, art. 8, p. 6, fig. 2, 1932 (type loc., Niuafoou Island).

Salarias aneitensis Günther.

Salarias aneitensis Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 15, Feb. 1932 (Apia); U. S. Nat. Mus., Proc., vol. 81, art. 8, p. 7, 1932 (Niuafoou Island).

New Hebrides material in the Australian Museum (Whitley).

Salarias alboguttatus Kner.

Salarias alboguttatus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 97, 1932 (Raiatea, Society islands).

Materials from Samoa and New Hebrides in the Australian Museum (Whitley).

Salarias gibbifrons Quoy and Gaimard.

Honolulu material in the Australian Museum (Whitley).

Salarias coronatus Günther.

Materials from Samoa and Santo, New Hebrides (Whitley).

Salarias edentulus (Schneider).

Salarias edentulus Fowler: U. S. Nat. Mus., Proc., vol. 80, art. 6, p. 15, 1932 (Eiao; Ua Huka; Taiohae). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 14, Oct.-Dec. 1931 (New Hebrides). Fowler: U. S. Nat. Mus., Proc., vol. 81, art. 8, p. 7, 1932 (Niuafoou Island).

Materials in the Australian Museum from Funafuti, Santa Cruz Islands, Santo in New Hebrides, Apia in Samoa (Whitley).

Salarias niuafoouensis Fowler.*

Salarias niuafoouensis Fowler: U. S. Nat. Mus., Proc., vol. 81, art. 8, p. 7, fig. 3, 1932 (type loc., Niuafoou Island).

Salarias irroratus Alleyne and Macleay.

Material from Vila, New Hebrides in the Australian Museum (Whitley).

Salarias zebra Vaillant and Sauvage.

Hawaiian material in the Australian Museum (Whitley).

Salarias periophthalmus Valenciennes.

Salarias periophthalmus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 14, Oct.-Dec. 1931 (New Hebrides).

Materials in the Australian Museum from Funafuti, Samoa, Pleasant Island, New Hebrides, Vaitupu as "vao" (jumping joey) in the Ellice Islands, Suva in Fiji, Pileni Islands of the Santa Cruz Group, and Dufaure Islands, New Guinea (Whitley).

Salarias dussumieri Valenciennes.

Salarias dussumieri Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 97, 1932 (Apia, Samoa; Fare Bay, Huahine Island, Society Islands).

Salarias geminatus Alleyne and Macleay.

Salarias geminatus Whitley: Australian Mus., Rec., vol. 15, no. 5, p. 304, Apr. 6, 1927 (New Caledonia).

Material from Noumea, New Caledonia, in the Australian Museum (Whitley).

Salarias biseriatus Valenciennes.

Samoan material in the Australian Museum (Whitley).

Salarias macneilli Whitley.*

Salarias macneilli Whitley: Australian Mus., Rec., vol. 16, no. 4, p. 227, pl. 18, fig. 1, Mar. 28, 1928 (type loc., New Hebrides).

Salarias macneilli coloratus Whitley: Australian Mus., Rec., vol. 16, no. 4, p. 229, Mar. 28, 1928 (type loc., Carlisle Bay, Santa Cruz Islands).

Type and paratype of *Salarias macneilli* (no. 1. 14286) 31 to 63 mm long, in the Australian Museum; type and paratype of *Salarias macneilli coloratus* (no. 1, 2493) (Whitley).

Salarias meleagris Valenciennes.

Salarias meleagris Fowler: U. S. Nat. Mus., Proc., vol. 80, art. 6, p. 15, 1932 (Eiao, Marquesas Islands).

Material from Santo, New Hebrides, in the Australian Museum (Whitley).

Salarias caudolineatus Günther.

Salarias caudolineatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 14, Oct.-Dec. 1931 (New Hebrides).

Materials from Samoa and Vila and Hog Harbor on Santo, New Hebrides in the Australian Museum (Whitley).

Salarias lineatus Valenciennes.

Salarias lineatus Fowler: U. S. Nat. Mus., Proc., vol. 81, art. 8, p. 9, 1932 (Niuafoou Island).

Australian Museum material from New Hebrides and Santa Cruz Islands (Whitley).

Salarias bilitonensis Bleeker.

Salarias bilotonensis Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 97, 1932 (Venus Point Reef, Tahiti) (error).

Salarias unicolor Rüppell.

Salarias unicolor Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 97, 1932 (Poonaruu Reef, Tahiti).

Salarias caesius Seale.

Salarias caesius Fowler: U. S. Nat. Mus., Proc., vol. 81, art. 8, p. 9, 1932 (Niuafoou Island).

Samoan material in the Australian Museum as *Salarias biseriatus*, (Whitley).

Salarias crenulatus Weber.*

Salarias crenulatus Weber: Siboga Exped., vol. 57, Fische, p. 532, fig. 112, 1913 (type loc., Sanana, Sula Besi Island; Tuir Island).

Materials from Santo and Hog Island, New Hebrides, in the Australian Museum (Whitley).

Herre publishes without description or figure, *Salarias walaensis* (Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 14, Oct.-Dec. 1931, type loc., Wala Island, New Hebrides).

Andamia expansa Blyth.*

Andamia expansa Blyth: Asiatic Soc. Bengal, Jour., p. 279, 1858 (type loc., Andaman Islands).

Materials from South West Bay, Malekula, New Hebrides, 50 to 87 mm long, in the Australian Museum (Whitley).

Enchelyurus ater (Günther).

Enchelyurus ater Pietschmann: B. P. Bishop Mus., Bull. 73, p. 22, 1930 (Kaneohe Bay, Oahu, near Coconut Island). Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 14, Oct.-Dec. 1931 (New Hebrides); vol. 7, no. 1, p. 6, Jan.-Mar. 1932 (Tahiti).

Australian Museum materials from Samoa and New Hebrides (Whitley).

XIPHASIIDAE

Xiphasia setifer Swainson.

Material in the Australian Museum from Vila, New Hebrides (Whitley).

MASTACEMBELIDAE

Mastacembelus armatus (Lacépède).*

Macrognathus armatus Lacépède: Hist. Nat. Poiss., vol. 2, pp. 283, 286, 1800 ("nous ignorons dans quel pays").

Macrognathus marmoratus Gray: Descr. Cat. Spec. Roy. College Surg., p. 33, 1859 (Fiji).

Previously known from the fresh waters of Ceylon, Bengal and Chusan. Its occurrence in Fiji, as recorded by Gray, likely an introduction.

BROTULIDAE

Brotula mulleri Günther.

Brotula mulleri Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 13, fig. 5, Aug. 1932 (Suva).

CARAPIDAE

Carapus homei (Richardson).

Carapus homei Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 10, Oct.-Dec. 1931 (Moorea, Society Islands); vol. 7, no. 1, p. 6, Jan.-Mar. 1932 (Tahiti).

Materials in the Australian Museum from Funafuti, Vanikoro, Duke of York Island, Admiralty Islands, Malekula in the New Hebrides, Malaita and Howla in the Solomons (Whitley).

Borodin (Vanderbilt Mar. Mus., Bull., vol. 1, art. 2, p. 62, 1930) has recorded *Fierasfer arenicola* (error) from Kaneohe Bay, Oahu, which may be some other species. *Fierasfer arenicola* Jordan and Gilbert was described in 1881 from Mazatlan, Mexico. It is hardly likely that Borodin's material is that species.

Jordanicus gracilis (Bleeker).

One in Bernice P. Bishop Museum, 215 mm long, from Fagasa, Tutuila, Samoa, Nov. 25, 1930 by D. T. Fullaway. Greatly like the figure of *Jordanicus umbratilis* (Jordan and Evermann). Pectoral 2 4/5 in head.

Jordanicus parvipinnis (Kaup).

Carapus parvipinnis Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 10, Oct.-Dec. 1931 (Moorea, Society Islands).

Materials in the Australian Museum from Naumaha Island and Vanikoro lagoon in the Santa Cruz Group (Whitley).

Encheliophis vermicularis J. Müller.

Encheliophis vermicularis Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 10, Oct.-Dec. 1931 (Moorea, Society Islands).

BATRACHOIDIDAE

Pseudobatrachus dubius (Shaw).

Material in the Australian Museum from southeast coast of New Guinea (Whitley).

Coryzichthys guttulatus Ogilby.

Cotype in the Australian Museum, 138 mm long, from the Aru Islands (Whitley).

GOBIESOCIDAE

Diplocrepis costatus Ogilby.*

Diplocrepis costatus Ogilby: Linn. Soc. New South Wales, Proc., p. 111, June 24, 1885 (nomen nudum); vol. 10, pt. 2, p. 270, July 31, 1885 (type loc., Shark Reef, Port Jackson). Whitley: Australian Mus., Rec., vol. 15, no. 5, p. 304, Apr. 6, 1927 (New Caledonia). McCulloch: Australian Mus. Mem., vol. 5, pt. 3, p. 360, Nov. 28, 1929 (New Caledonia).

Material in the Australian Museum from Noumea, New Caledonia (Whitley).

BALISTIDAE

Balistes vidua Richardson.

Balistes vidua Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 10, Oct.-Dec. 1931 (Moorea, Society Islands); vol. 7, no. 1, p. 6, Jan.-Mar. 1932 (Tahiti). Fowler: U. S. Nat. Mus., Proc., vol. 81, art. 8, p. 9, 1932 (Niuafoou Island). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 98, 1932 (Coral Sea, Noumea, New Caledonia).

Material in the Australian Museum from the Gilbert Islands and Bougainville Island, Solomons (Whitley).

Balistes chrysopterus Schneider.

Australian Museum material from the Solomons and Eromanga in the New Hebrides (Whitley).

Balistes capistratus Shaw.

Material in the Australian Museum from Aneiteum, New Hebrides (Whitley).

Balistes bursa Schneider.

Balistes bursa Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 10, Oct.-Dec. 1931 (Moorea, Society Islands). Giltay: Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 113 (Menokwari, New Guinea).

Balistes conspicillum Schneider.

Materials in the Australian Museum from Aneiteum, New Hebrides, and Rennell, Solomons (Whitley).

Balistes viridescens Schneider.

Balistes viridescens Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 9, Oct.-Dec. 1931 (Hathorne Sound, Solomons), p. 14, (New Hebrides).

Materials in the Australian Museum from Port Moresby and Dutch New Guinea (Whitley).

Balistes flavimarginatus Rüppell.

Australian Museum materials from Funafuti and Port Moresby, New Guinea (Whitley).

Balistes papuensis Macleay.*

Balistes papuensis Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 279, 1884 (type loc., Hood Bay, New Guinea).

Type in the Australian Museum 118 mm long, from Hood Bay, New Guinea (Whitley).

Balistapus aculeatus (Linnaeus).

Balistapus aculeatus Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 6, Jan.-Mar. 1932 (Tahiti).

Balistes aculeatus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 98, 1932 (Apia, Samoa).

Balistapus aculeatus variety *obscurus* Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 2, p. 62, 1930 (type loc., Oahu, Hawaii).

Materials in the Australian Museum from Samoa, Funafuti, Tongatabu, Duke of York Island, Suva in Fiji, Vanikoro, Ontong Java, Vila and Efati in New Hebrides, Vaitupu as "sumu" (trigger fish) in the Ellice Islands, Solomons in Bougainville Island, Bareke, and New Georgia, Port Moresby in New Guinea (Whitley).

Balistapus rectangulus (Schneider).

Materials in the Australian Museum from Ontong Java, Hawaii, Friendly Islands, and Ugi in the Solomons (Whitley).

Balistapus verrucosus (Linnaeus).

Australian Museum materials from Duke of York Island, Bougainville Island in Solomons, Port Moresby in New Guinea (Whitley).

Balistapus undulatus (Mungo Park).

Balistapus undulatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 9, Oct.-Dec. 1931 (Tenibuli and Ugi, Solomons), p. 10 (Moorea, Society Islands), p. 14 (New Hebrides); vol. 7, no. 1, p. 6, Jan.-Mar. 1932 (Tahiti). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 16, Feb. 1932 (Pago Pago); U. S. Nat. Mus., Proc., vol. 81, art. 8, p. 9, 1932 (Niuafoou Island); B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 13, Aug. 1932 (Suva).

Balistes undulatus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 98, 1932 (Apia, Samoa).

Balistapus lineatus Gray: Descr. Cat. Spec. Roy. College Surg., p. 48, 1859 (China; Louisade Archipelago).

Materials in the Australian Museum from Samoa, Suwarow Island, New Hebrides, Gilberts, Santa Cruz Islands, Admiralty Islands, Duke of York Island, New Britain, Ugi in Solomons, Port Moresby in New Guinea (Whitley).

Melichthys buniva (Lacépède).

Honolulu and Hawaiian islands materials in the Australian Museum (Whitley).

Odonus erythrodon (Günther).

Materials in the Australian Museum from Gilbert Islands, Duke of York Island, and Ugi in the Solomons (Whitley).

MONACANTHIDAE

Cantherines pardalis (Rüppell).

Depth 1 9/10; head 2 1/3. Snout 1 1/4 in head; eye 4 1/3, 3 1/4 in snout. Dorsal spine inserted over front of eye, rays 34; A. 31; caudal peduncle smooth, without spines; ventral spine firm, immovable. Uniform dark neutral gray. First dorsal and caudal darker than body. Soft dorsal and anal whitish. Pectoral pale gray. One, 88 mm long, from off Avarua Harbor, Rarotonga on July 8, 1929, by Wilder and Parks, in Bernice P. Bishop Museum.

Monacanthus melanocephalus Bleeker.

Materials in the Australian Museum from Samoa, New Hebrides, and Engineer Group (Whitley).

Monacanthus tomentosus (Linnaeus).

Stephanolepis tomentosus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 9, Oct.-Dec. 1931 (Tenibuli, Solomons).

Materials in the Australian Museum from Ysabel in Solomons and Port Moresby, New Guinea (Whitley).

Monacanthus spilosoma Lay and Bennett.

Hawaiian Islands material in the Australian Museum (Whitley).

Amanses scopas (Cuvier).

Amanses scopas Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 9, Oct.-Dec. 1931 (Tenibuli, Solomons).

Oxymonacanthus longirostris (Schneider).

Materials in the Australian Museum from the New Hebrides, Friendly Islands, New Britain and Bougainville Island at Numa Numa (Mrs. P. Mildwater) in Solomons (Whitley).

Paraluteres prionurus (Bleeker).

New Hebrides material in the Australian Museum (Whitley).

Alutera scripta (Osbeck).

Material from Hood Bay, New Guinea, in the Australian Museum (Whitley).

Alutera monoceros (Linnaeus).

Australian Museum material from Hood Bay, New Guinea (Whitley).

OSTRACIIDAE

Ostracion cubicus Linnaeus.

Ostracion cubicus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 13, Aug. 1932 (Suva). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 98, 1932 (Raiatea, Society Islands).

Ostracion tuberculatus Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 6, Jan.-Mar. 1932 (Tahiti).

Australian Museum materials from Fiji, New Hebrides, Admiralty Islands, and Port Moresby, New Guinea (Whitley).

Ostracion sebae Bleeker.

Ostracion sebae Fowler: U. S. Nat. Mus., Proc., vol. 80, art. 6, p. 16, 1932 (Maraguei, Toan Atoll, Tuamotus).

Materials in the Australian Museum from Peleni Island in Santa Cruz Group and Engineer Group (Whitley).

Ostracion lentiginosus Schneider.

Ostracion lentiginosum Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 2, p. 62, 1930 (Honolulu).

Ostracion punctatus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 98, 1932 (Noumea, New Caledonia).

Material in the Australian Museum from the Solomons (Whitley).

One in Bernice P. Bishop Museum 100 mm long, off Avarua Harbor, Rarotonga, on July 8, 1929, by Wilder and Parks. Of fins only caudal variegated with white spots, like those on head, trunk, and tail.

Ostracion cornutus Linnaeus.

Ostracion cornutus Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 6, Jan.-Mar. 1932 (Tahiti).

Material in the Australian Museum from Fife Bay and Port Moresby (Whitley).

Ostracion fornasini Bianconi.

Ostracion fornasini Ginsburg: B. P. Bishop Mus., Bull. 107, p. 20, 1933 (Pearl and Hermes Reef).

CANTHIGASTERIDAE

Canthigaster cinctus (Richardson).

Materials in the Australian Museum from the Solomons and New Hebrides (Whitley).

Canthigaster bennettii (Bleeker).

Material from Santo, New Hebrides, in the Australian Museum (Whitley).

Canthigaster margaritatus (Rüppell).

Canthigaster margaritatus Herre: Pan-Pac. Research Inst., Jour., vol. 6, no. 4, p. 10, Oct.-Dec. 1931 (Moorea, Society Islands). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 16, Feb. 1932 (Pago Pago).

Materials from Samoa and Funafuti in the Australian Museum (Whitley).

Canthigaster janthinopterus (Bleeker).

Material from Santo, New Hebrides, in the Australian Museum (Whitley).

TETRODONTIDAE

Sphoeroides lagocephalus (Linnaeus).

Tetrodon inermis Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 98, 1932 (Suva, Fiji).

Tetrodon inermis variety *taeniatus* Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 98, 1932 (type loc., Suva, Vitilevu, Fiji).

Sphoeroides sceleratus (Gmelin).

Tetrodon sceleratus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 99, 1932 (Momi Bay, Vitilevu Island, Fiji).

Materials in the Australian Museum from Engineer Group and Hood Bay, New Guinea (Whitley).

Sphoeroides hypselogenion (Bleeker).

Spheroides hypselogenion Ginsburg: B. P. Bishop Mus., Bull. 107, p. 20, 1933 (Pearl and Hermes Reef).

Honolulu material in the Australian Museum (Whitley).

Tetrodon immaculatus Schneider.

Tetrodon immaculatus Pietschmann: B. P. Bishop Mus., Bull. 73, p. 22, 1930 (Suva). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 20, p. 13, 1932 (Suva). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 98, 1932 (Apia, Samoa). Giltay: Mus. Roy. Hist. Nat. Belg., Mem., vol. 5, fasc. 3, p. 115, 1933 (Sorong, New Guinea).

Materials in the Australian Museum from Funafuti, Friendly Islands, Vati in New Hebrides, Bougainville Island in Solomons (Whitley).

Tetrodon mappa Lesson.

Specimen 500 mm long from the Gilbert Islands in the Australian Museum (Whitley).

Tetrodon stellatus Schneider.

Tetrodon stellatus Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 99, 1932 (Raiatea, Society Islands).

Materials in the Australian Museum from Banks Group and Port Moresby, New Guinea (Whitley).

Tetrodon reticularis (Schneider).

Materials from Suva, Fiji, in the Australian Museum (Whitley).

Tetrodon hispidus Linnaeus.

In the Australian Museum materials from Duke of York Island, New Britain, Vaitupu as "sue" (toad) in Ellice Islands, New Hebrides (Whitley).

Tetrodon nigropunctatus Schneider.

Tetrodon nigropunctatus Pietschmann: B. P. Bishop Mus., Bull. 73, p. 23, 1930 (Guam). Fowler: B. P. Bishop Mus., Occ. Papers, vol. 9, no. 18, p. 16, Feb. 1932 (Fagamalo, Samoa). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 99, 1932 (Pango Pango, Samoa).

Materials in the Australian Museum from Samoa and Funafuti (Whitley).

Tetrodon meleagris Schneider.

Tetrodon meleagris Pietschmann: B. P. Bishop Mus., Bull. 73, p. 22, 1930 (Waikiki Reef).

DIODONTIDAE

Diodon hystrix Linnaeus.

Diodon hystrix Herre: Pan-Pac. Research Inst., Jour., vol. 7, no. 1, p. 6, Jan.-Mar. 1932 (Tahiti). Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 3, p. 99, 1932 (Poonaruu Reef, Tahiti).

Solomon Islands materials in the Australian Museum (Whitley).

Diodon holacanthus Linnaeus.

Diodon holacanthus Ginsburg: B. P. Bishop Mus., Bull. 107, p. 20, 1933 (Pearl and Hermes Reef).

Material in the Australian Museum from Bougainville Island, Solomons (Whitley).

MOLIDAE

Masturus lanceolatus (Liénard).

Masturus lanceolatus Schmidt: Medd. Komm. Havund., vol. 6, no. 6, p. 12, fig. 11, 1921 (between Ellice and Union Islands, from stomach of king fish, 9 to 13 meters).

Material in the Australian Museum from between Ellice and Union Islands (Whitley).

ANTENNARIIDAE

Histrio histrio (Linnaeus).

Antennarius marmoratus Duncker and Mohr: Naturh. Mus. Hamburg, Mitteil., vol. 44, p. 70, 1931 (east of Long Island, New Guinea; Kewieng, north coast New Guinea).

Materials from Daru, near Fly River estuary, New Guinea, in the Australian Museum (Whitley).

Antennarius commersonii (Shaw).

Antennarius commersonii Borodin: Vanderbilt Mar. Mus., Bull., vol. 1, art. 2, p. 62, 1930 (Maui). Ginsburg: B. P. Bishop Mus., Bull. 107, p. 20, 1933 (Pearl and Hermes Reef).

Material in the Australian Museum from Duke of York Island and New Britain (Whitley).

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INDEX

(Page numbers in bold type indicate principal references.)

A — Page

abacurus, Callyodon 440
abax, Asternolopteryx 441
Asterropterix 441
Eviota 441
abbreviata, Moringua 389
Ratabouria 389
abbreviatus, Gerres 419
abdominalis, Abudefduf 434
Ablennes hians 392
Abudefduf abdominalis 434
anabilis 435
bankieri 436
behnii 435
bengalensis 434
bimaculatus 436
biocellatus 435
brownriggi 435
coelestinus 434
curacao 435
cyaneus 435
dickii 435
filamentosus 435
glaucus 435
hedleyi 435
lacrymatus 435
leucogaster 435
leucopomus 435
leucozonus 435
melas 435
metallicus 435
notatus 435
saxatilis 434
sexfasciatus 434
sordidus 434
taupo 435
unimaculatus 435
uniocellatus 435
xanthozona 436
xanthurus 435
zonatus 436
Acanthochromis polyacanthus 432
Acanthocybium solandri 400
Acanthurus achilles 427
aliaia 427
celebicus 427
elongatus 427
flavoguttatus 427
galum 427
glaucopareius 427
insipiens 428
leucosternon 427
lineatus 427
matoides 427
triastegus 427
triostegus 427
achilles, Acanthurus 427
Hepatus 427
Achirophichthys kampeni 389
acinaces, Gerres 419
acipenserinus, Mataeocephalus 394
aculeatus, Balistapus 448
Balistes 448
acuminatus, Heniochus 425
acuta, Dussumieria 387
Adamia expansa 446
adustus, Myripristis 396
Aeoliscus strigatus 398
aerosa, Scaridea 439
Aeschrichthys goldiei 399
Aetobatis narinari 386
afelei, Eviota 441
affine, Diagramma 415
Myctophum 391
affinis, Hemiramphus 393
agassizii, Diaphus 392
albacores, Germo 400
albescens, Echeneis 444
albifrons, Tetraroge 431
albobrunneus, Sebastapistes 429
albofasciatus, Pomacentrus 434
alboguttatus, Salarias 446
albovittata, Stethojulis 436
albovittatus, Plectorhinchus 415
Albula conorynchus 386
vulpes 386
Alectis breviventralis 405
ciliaris 405
indicus 405
temmincki 405
alfredi, Ceratoptera 386
Desmomanta 386
Manta 386
aliaia, Acanthurus 427
alletteratus, Euthynnus 400
altipennis, Cypselurus 393
Alutera monoceros 448
scripta 448
amabilis, Abudefduf 435
Amanses scopas 448
Ambassis batjanensis 408
buroensis 408
commersoni 408
gigas 408
gymnocephalus 408
interrupta 408
lafa 408
miops 408
safgha 408
vaivasensis 408
Amblyapistus longispinis 431
amblycephalus, Thalassoma 438
Amblygobius insignis 444
myersi 444
phalaena 444
amboinensis, Amia 407
Apogon 407
Butis 441
Lethrinus 417
Pomacentrus 434
Amia amboinensis 407
apogonoides 407
aroubiensis 407
bandanensis 406
ceramensis 407
compressa 407
cyanosoma 406
cypselura 407
exostigma 407
fasciata 406
fleurieu 407
(Foa) fo 408
frenata 407
hartzfeldii 406
hyalosoma 407
hypselonotus 407
kalosoma 407
laterale 407
maculifera 407
melas 407
multitaeniata 407
nematoptera 406
novemfasciata 406
orbicularis 406
poeciloptera 406
sangiensis 407
trimaculata 406
wichmanni 406
Amiidae 406
Amphacanthus guttatus var. oramin 429
lineatus 429
margaritiferus 428
Amphiprion bicinctus 431
melanopus 431
papuensis 431
percula 431
polymnus 431
rosenbergi 431
anago, Ariosoma 388
analis, Chromis 432
Anampses caeruleo-punctatus 436
cuvier 436
dimidiatus 436
godeffroyi 436
pterophthalmus 436
Anarchias knighti 390
anchorago, Chaerops 436
Choerodon 436
Anchoviella apiensis 387
heterolobus 387
indica 387
insularum 387
purpurea 387
anderseni, Diaphus 392
andrae, Centrobranchus 391
andreae, Myctophum 391
aneitensis, Salarias 445
Anguilla australis 388
celebensis 388
mauritiana 387, 388
obscura 388
reinhardtii 387
anguillaris, Plotosus 391
anguillicaudatus, Misgurnis 391
angulata, Coris 437
anjerensis, Gnatholepis 443
annulatus, Naso 428
Anodontostoma chacunda 387
anoga, Conger 388
Anomalopidae 394
Anomalops katoptron 394
palpebratus 394
Antennariidae 450
Antennarius bigibbus 450
commersonii 450
marmoratus 450
mummifer 450
reticulatus 450
antennata, Pterois 430
Anthias margaritaceus 411
moorensis 411
mortoni 411
orientalis 415
pleurotaenia 411
antjerius, Glyphidodon 435
Anyperodon leucogrammicus 411
Aphareus furcatus 413
rutilans 413
Aphthalmichthys javanicus 389
apicalis, Ophichthus 388
Ophisurus 388
apiensis, Anchoviella 387
Apistus longispinis 431
Apocryptes fasciatus 444
serperaster 444
serperastes 444
Apocryptodon fasciatus 444
Apogon amboinensis 407
apogonoides 407
aroubiensis 407
bandanensis 406
bondanensis 406
calosoma 407
compressa 407
cyanosoma 406
exostigma 407
fasciatus 406
frenatus 407
hartzfeldi 406
heptacanthus 407
hyalosoma 407

PAGE
kalosoma 407
lateralis 407
melas 407
multitaeniatus 407
novemfasciatus 406
orbicularis 406
poecilopterus 406
rhodopterus 406
robusta 406
sangiensis 407
snyderi 407
thermalis 407
trimaculatus 406
weberi 406
zosterophora 408
Apogonichthys auritus 407
brachygrammus 408
perdix 408
polystigma 408
apogonoides, Amia 407
Apogon 407
Cheilodipterus 407
Tetracentrum 408
aporos, Ophiocara 441
Aprion virescens 413
Apsilus zonatus 413
arab, Plotosus 391
arabicus, Muroenesox 388
arcatus, Paracirrhites 423
Archamia buruensis 408
lineolata 408
zosterophora 408
arcticeps, Cypselurus 393
arcticus, Galeocerdo 385
arcuatus, Holacanthus 426
arenicola, Fierasfer 447
Fieraster 447
areolata, Perca summana 410
areolatus, Epinephelus 410
Serranus 410
arge, Upeneus 421
argentea, Datnia 416
argenteum, Holocentrum 395
argenteus, Dules 409
Gymnocaesio 415
Hemiramphus 393
Kuhlia 409
Monodactylus 423
Oxyporhamphus 393
Siganus 429
argentilineatus, Periophthalmus koebreuteri 444
argentimaculatus, Lutianus 414
Lutjanus 414
Argentina machnata 386
argus, Cephalopholis 409
Epinephelus 409
Halichoeres 437
Scatophagus 423
argyreus, Gerres 419
argyrogrammicus, Pristipomoides 413
Serranus 413
Ariomma evermanni 403
lurida 403
Ariosoma anago 388
bowersi 388
Aristeus goldiei 398
Arius froggatti 391
latirostris 391
spatula 391
armatus, Carangoides 405
Caranx 405
Macrognathus 447
Mastacembelus 447
aroubiensis, Amia 407
Apogon 407
aruanus, Dascyllus 432
aruensis, Valenciennea 442
ascensionis, Caranx 404
asper, Dasyscopelus 391
Myctophum 391
asperrimus, Urogymnus 386
Aspidontus maroubrae 445
Asseraggodes persimilis 394
Asternopteryx abax 441

PAGE
Asterropterix abax 441
semipunctatus 441
astridae, Diaphus 392
ater, Enchelyurus 447
aterrimus Rhinogobius 443
Atherina endrachtensis 398
forskali 398
forskalii 398
insularum 398
temmincki 398
temminckii 398
temminkii 398
uisila 398
Atherinidae 398
atherinoides, Hynnodus 408
atra, Taenuira 386
atriceps, Enneapterygius 445
atrisignis, Cypselurus 393, 394
atrocingulatus, Pseudupeneus 420
Upeneus 420
Upeneus trifasciatus var. 420
atropos, Atropus 405
Brama 405
Atropus atropos 405
Aulopidae 391
Aulostomidae 398
Aulostoma valentini 398
Aulostomus chinensis 398
auratus, Carassius 390
Pagrosomus 418
auriflamma, Mulloides 420
Mulloidichthys 420
auriga, Chaetodon 424
auritus, Apogonichthys 407
Scarichthys 439
aurolaternatum, Myctophum 391
aurolineatum, Pentapodus 418
aurolineatus, Pentapus 418
australis, Anguilla 388
Engraulis 387
Istiompax 400
Makaira 400, 402
Muraena 388
axillaris, Corvina 422
Johnius 422
Stethojulis 436
aygula, Coris 437
azureus, Sectator 419

B

baconensis, Gerres 419
Xystaema 419
baelama, Thrissocles 387
bahiensis, Cypselurus 394
baillonii, Trachinotus 406
balieui, Thalassoma 438
baliensis, Callyodon 440
Hemiramphus 390
Balistapus aculeatus 448
lineatus 448
aculeatus var. obscurus 448
rectangulus 448
undulatus 448
verrucosus 448
Balistes aculeatus 448
bursa 447
capistratus 447
chrysopterus 447
conspicillum 447
flavimarginatus 448
papuensis 448
undulatus 448
vidua 447
viridescens 447
Balistidae 447
baliuroides, Gobius 443
Rhinogobius 443
balli, Micrognathus 391
ballieui, Coris 437
Thalassoma 438
bandanensis, Amia 406
Apogon 406
bankiensis, Trachycephalus 431
bankieri, Abudefduf 436
barbarus, Periophthalmus 444

PAGE
barbatus, Crossorhinus 385
barberinoides, Pseudupeneus 420
barberinus, Parupeneus 420
Pseudupeneus 420
Upeneus 420
barracuda, Sphyraena 399
bataviensis, Callyodon 440
Bathygobius fuscus 442
batjanensis, Ambassis 408
Batrachoididae 447
behnii, Abudefduf 435
Belone choram 392
platyura 392
Belonidae 392
bennetti, Callyodon 440
Chaetodon 423
bennetti, Canthigaster 444
bensasi, Mullus 422
Upeneoides 422
Upeneus 421
Benthosema pinchoti 392
berda, Sparus 418
biaculeatus, Premnas 431
Syngnathoides 396
bicolor, Callyodon 441
Centropyge 426
Rataboura 389
bicinctus, Amphiprion 431
bifasciatus, Pomacentrus 434
Pseudupeneus 421
Upeneus 421
bigibbus, Antennarius 450
Kyphosus 419
biguttatus, Lutianus 413
Lutjanus 413
bilineatus, Pseudupeneus 421
Scolopsis 416
bilitonensis, Salarias 446
bilotonensis, Salarias 446
bilunulatus, Lepidaplois 436
bimacula, Cirrhitoidea 422
Oxycirrhites (Cirrhitoidea) 422
bimaculatus, Abudefduf 436
Cheilinus 439
Glyphisodon 436
binotatus, Holocentrus 395
binotopsis, Halichoeres 437
biocellatus, Abudefduf 435
Glossogobius 443
Pomacentrus 433
bipinnulatus, Elagatis 403
birostris, Manta 386
biseriatus, Salarias 446
bispinosus, Centropyge 426
Holacanthus 426
bixanthopterus, Caranx 404
bleekeri, Myripristis 396
Blenniidae 445
Blennius marmoratus 445
pholis 445
Blepharis ciliaris 405
blochii, Caesiomorus 405
Callyodon 440
Trachinotus 405
bohar, Lutianus 413
Lutjanus 413
bondanensis, Apogon 406
bontoides, Epinephelus 410
Serranus 410
boops, Caranx (Selar) 403
Priacanthus 412
Selar 403
borneensis, Mugil 399
boro, Pisodonophis 388
Bostrichthys sinensis 441
Bothus pantherinus 394
botla, Trachinotus 406
bowersi, Ariosoma 388
brachygrammus, Apogonichthys 408
brachypterus, Dendrochirus 430
Parexocoetus 393
brachysoma, Rastrelliger 400
brachysomus, Leptoscarus 439
Microphis 397
Scomber 400

PAGE
Brama atropos 405
raii 400, 423
Bramidae 400
brasiliensis, Hemiramphus 393
Isistius 386
Bregmaceros mcclellandi 394
mcclellandii 394
Bregmacerotidae 394
breviceps, Glyphisodon 433
Pomacentrus 433
brevirostris, Micrognathus 397
Naso 428
breviventralis, Alectis 405
brookei, Istiophorus 400, 401
Brotula mulleri 447
Brotulidae 447
brownriggi, Abudefduf 435
Glyphidodon 435
brummeri, Pseudechidna 389
Strophidon 389
Bryanina inana 442
bullata, Thyrsoidea 390
buniva, Melichthys 448
buroensis, Ambassis 408
Muraena 390
bursa, Balistes 447
buruensis, Archamia 408
Priopis 408
Butis amboinensis 441
butis, Eleotris 441
bynoensis, Sebastapistes 429
Scorpaena 429

C

Caecula polyophthalma 389
polyophthalmus 389
caerulaureus, Casio 415
caeruleomaculata, Liza 399
caeruleopinnatus, Caranx 404
caeruleo-punctatus, Anampses 436
Serranus 411
caeruleopunctatus, Epinephelus 411
Scarichthys 439
caeruleus, Chromis 432
Pomacentrus 433
Caesio caerulaureus 415
chrysozonus 415
cuning 414
erythrogaster 415
lunaris 415
Caesiomorus blochii 405
caesius, Salarias 446
calamara, Chrysophrys berda var. 418
calamus, Ophichthus 389
calcarifer, Lates 409
Callicanthus lituratus 428
Callionymidae 444
Callionymus microps 444
Calliurichthys decoratus 444
Callogobius hasseltii 443
sclateri 443
Callyodon abacurus 440
balinensis 440
bataviensis 440
bennetti 440
bicolor 441
blochii 440
caudofasciatus 440
dimidiatus 440
dubius 440
erythrodon 440
forsteri 440
frenatus 440
ghobban 441
globiceps 441
guttatus 441
lasulinus 440
microcheilos 440
microcheilus 440
microrhinos 440
moensi 440
mutabilis 440
nuchipunctatus 441
oviceps 440
pectoralis 440
perspicillatus 440
pulchellus 440
quoyi 440
ruberrimus 440
rubroviolaceus 440
sordidus 440
spinus 440
troscheli 440
ultramarinus 440
upolensis 440
zonularis 440
Callyodontidae 439
calosoma, Apogon 407
canadum, Rachycentron 406
canadus, Rachycentron 406
canaliculatus, Siganus 428
cancellata, Percis 444
cancellatus, Scolopsis 415
Terapon 416
Therapon 416
canescens, Zanclus 426
canina, Enchelynassa 390
caninus, Pentapodus 418
Pentapus 418
Cantherines pardalis 448
Canthigaster bennetti 449
cinctus 449
janthinopterus 449
margaritatus 449
Canthigasteridae 449
capistratus, Balistes 447
Caracanthidae 431
Caracanthus maculatus 431
unipinna 431
Carangichthys typus 405
Carangidae 403
Carangoides 405
armatus 405
dinema 405
ferdau 405
gymnostethoides 405
gymnostethus 405
malabaricus 405
oblongus 405
carangoides, Caranx 405
Carangus cheilio 405
elacate 404
latus 404
melampygus 404
rhabdotus 404
carangus, Caranx 404
Caranx (Caranx) 404
Caranx 405
armatus 405
ascensionis 404
bixanthopterus 404
(Selar) boops 403
caeruleopinnatus 404
carangoides 405
carangus 404
(Caranx) carangus 404
cheilio 405
(Selar) crumenophthalmus 403
dasson 405
dumerili 403
elacate 404
equula 405
ignobilis 404
ishikawai 404
jarra 405
kalla 404
kuhlii 404
leptolepis 405
longipes 405
lugubris 404
malabaricus 405
(Carangoides) malabaricus 405
mate 404
(Selar) mate 404
melampygos 404
melampygus 404
(Caranx) melampygus 404
moresbyensis 404
novae guineae 405
oblongus 405
platessa 405
(Longirostrum) platessa 405
punctatus 404
sansun 405
sexfasciatus 404
(Caranx) sexfasciatus 404
stellatus 404
(Caranx) stellatus 404
Xanthopygus 404
Carapidae 447
Carapus homei 447
parvipinnis 447
Carassius auratus 390
carbunculeis, Etelis 413
Carcharias marianensis 385
melanopterus 385
carinatus, Mugil 399
carneum, Tetradrachmum 432
carneus, Dascyllus 432
Myripristis 396
casturi, Stethojulis 436
catenata, Muraena 390
caudimaculatus, Holocentrus 395
caudofasciatus, Callyodon 440
caudolineatus, Salarias 446
caudovittatus, Terapon 416
Therapon 416
celebensis, Anguilla 388
celebesensis, Muraena 388
celebicus, Acanthurus 427
Dentex 418
Plectorhinchus 415
Synagris 418
centriquadrus, Halichoeres 437
Halicoeres 437
Centriscidae 398
Centriscus strigatus 398
Centrobranchus andrae 391
choerocephalus 391
Centrolophidae 403
Centropyge bicolor 426
bispinosus 426
fisheri 426
flavissimus 426
loriculus 426
multispinis 426
nox 426
potteri 426
tibicen 426
vrolikii 426
Cephalacanthidae 431
Cephalopholis argus 409
cyanostigma 409
kendalli 409
leopardus 410
miniatus 410
pachycentron 409
pachycentrum 409
rogaa 410
urodelus 410
cephalus, Mugil 399
ceramensis, Amia 407
Ceratoptera alfredi 386
Cestraeus goldiei 399
plicatilis 399
chacunda, Anodontostoma 387
Chatoessus 387
Chaenomugil chaptali 399
Chaerodon anchorago 436
Chaerops anchorago 436
oligacanthus 436
Chaetodon auriga 424
bennetti 423
citrinellus 424
cornutus 426
ephippium 423
falcula 425
fasciatus 424
flavirostris 424
fremblii 423
setifer var. hawaiiensis 424
kleinii 424
lineolatus 424
lunula 424
melannotus 424

PAGE
mesoleucus 425
miliaris 424
ocellicauda 424
ocellicaudatus 424
octofasciatus 424
ornatissimus 423
pelewensis 423
plebeius 425
punctato-fasciatus 424
rafflesi 424
rafflesii 424
reticulatus 424
setifer 424
speculum 423
triangulum 425
trifascialis 425
trifasciatus 423
triostegus 426
ulietensis 425
unimaculatus 424
vagabundus 424
chaetodonoides, Plectorhinchus 415
Chaetodontidae 423
Chaetodontoplus mesoleucus 425
chalybaeus, Therapon 416
Chandidae 408
Chanidae 386
Chanos chanos 386
salmoneus 386
chanos, Chanos 386
chaptali, Chaenomugil 399
chaptalii, Neomyxus 399
Chatoessus chacunda 387
nasus 387
Cheilinus bimaculatus 439
chlorourus 439
diagrammus 439
fasciatus 439
kitlitzii 439
oxyrhynchus 439
radiatus 439
trilobatus 439
undulatus 439
cheilio, Carangus 405
Caranx 405
Cheilio inermis 439
Cheilodipterus apogonoides 407
lineatus 408
quinquelineatus 408
Cheiloprion labiatus 432
Chelidoperca margaritifer 411
Chelodonichthys kumu 431
Chilodipterus quinquelineatus 408
chilospila, Lycodontis 390
chilospilus, Gymnothorax 390
chinensis, Aulostomus 398
chlorcus, Dendrochirus 430
chlorocephalus, Epinephelus 410
Serranus 410
Chlorophthalmus proridens 391
chlorourus, Cheilinus 439
chocrocephalus, Centrobranchus 391
Choerodon anchorago 436
Choeroichthys sculptus 396
Chonophorus genivittatus 443
guamensis 443
ocellaris 443
choram, Belone 392
Strongylura 392
Choridactylus multibarbis 431
Chorinemus lysan 403
orientalis 403
tala 403
tol 403
toloo 403
toloparah 403
Chromis analis 432
caeruleus 432
dimidiatus 432
elerae 432
iomelas 432
ternatensis 432
chryserydris, Parupeneus 421
chryserydros, Upeneus 421
chrysonemus, Pseudupeneus 421
Chrysophrys berda var. calamara 418
cuvieri 418
hasta 418
major 418
sarba 418
chrysopoma, Pseudoscarus 440
chrysopterus, Balistes 447
chrysostomus, Heniochus 425
chrysotaenia, Lutianus 413
Lutjanus 413
chrysozonus, Caesio 415
Rastrelliger 399
ciliaris, Alectis 405
Blepharis 405
ciliatus, Dules 409
Scolopsis 416
cincta, Pterois 430
cinctus, Canthigaster 449
Paracirrhites 423
cinerascens, Kyphosus 419
Pimelepterus 419
cinereus, Conger 388
Muraenesox 388
cinnabarinus, Upeneus 421
Pseudupeneus 421, 422
cinnaborinus, Upeneus 421
circumspectus, Glossogobius 443
Gobius 443
Cirrhilabrus solorensis 439
Cirrhites marmoratus 423
Cirrhitichthys marmoratus 422
oxycephalus 423
Cirrhitidae 422
Cirrhitoidea bimacula 422
Cirrhitus forsteri 423
marmoratus 422
oxycephalus 423
pinnulatus 422
cirrhosus, Scorpaenopsis 429
Cirripectes variolosus 445
citrinellus, Chaetodon 424
Taenianotus 431
citrinus, Gobiodon 442
Hoplichthys 431
Clinus perspicillatus 445
Clupanodon thrissa 387
Clupea (Harengula) fimbriata 387
melanura 387
sindensis 387
Clupeidae 387
Clupeoides papuensis 387
Cobitidae 391
cocco, Myctophum 392
cocosensis, Lethrinus 417
coelestinus, Abudefduf 434
Glyphisodon 434
Coelonotus platyrhynchus 396
coeruleus, Gomphosus 438
coloratus, Salarias macneilli 446
colubrinus, Myrichthys 388
commersoni, Ambassis 408
commersonii, Antennarius 450
compressa, Amia 407
Apogon 407
compressus, Mugil 399
concatenatus, Siganus 429
concavifrons, Glossogobius 443
Gobius 443
concolor, Gymnomuraena 390
Gymnothorax 390
Uropterygius 390
Conger anoga 388
cinereus 388
conger 388
conger, Conger 388
Leptocephalus 388
conorynchus, Albula 386
conospicillum, Balistes 447
conspicillatus, Corythoichthys 397
cookei, Echinorhinus 386
Cookeolus 412
corallicola, Serranus 410
cordyla, Megalaspis 403
Corica papuensis 387
Coris angulata 437
aygula 437
ballieui 437
cyanea 437
flavovittata 438
gaimard 438
lepomis 438
pulcherrima 438
venusta 437
corlettei, Gnatholepis 443
corneliae, Giffordella 445
cornutum, Holocentrum 395
cornutus, Chaetodon 426
Holocentrus 395
Ostracion 449
Salarias 446
Zanclus 426
corrugatus, Corythoichthys 397
Corvina axillaris 422
Coryphaena lutea 418
Coryphaenoides gibber 394
Coryphaenoididae 394
Corythoichthys conspicillatus 397
corrugatus 397
crenulatus 397
flavofasciatus 397
uncinatus 397
Corythroichthys intestinalis 397
Coryzichthys guttulatus 447
costatus, Diplocrepis 447
cranei, Pomacentrus 433
Thalassoma 438
crassiceps, Melamphaes 394
Scopelus 394
crassilabris, Hemipimelodus 391
Pseudupeneus 422
crassispinis, Plectorhinchus 415
crebripunctata, Gymnura 386
crenilabis, Mugil 399
crenilabrus oligacanthus 436
crenulare, Myctophum 391
crenulatus, Corythoichthys 397
Salarias 446
Syngnathus 397
cribroris, Gymnothorax 390
Lycodontis 390
cribrosa, Exocoetus 394
cribrosus, Cypselurus 394
crista-galli, Tetraroge 431
crocodila, Strongylura 392
crocodilus, Thysanophrys 431
crossorhinus barbatus 385
ornatus 385
cruentatus, Priacanthus 412
crumenalis, Pelecanichthys 394
crumenophthalmus, Caranx (Selar) 403
Selar 403
Cryptocentrus leucostictus 444
Ctenochaetus striatus 427
strigosus 427
Ctenochetus strigosus 427
Ctenoscolopsis 416
Cubiceps evermanni 403
thompsoni 403
cubicus, Ostracion 448
cuncalus, Syngnathus 397
cuning, Caesio 414
cunnesius, Mugil 398
curacao, Abudefduf 435
cuspidatus, Hemiramphus 393
cuvier, Anampses 436
cuvieri, Chrysophrys 418
Sparus 418
cyanea, Coris 437
cyaneus, Abudefduf 435
cyanosoma, Amia 406
Apogon 406
cyanostigma, Cephalopholis 409
Serranus 409
cyanotaenia, Labrichthys 436
Cybium solandri 400
cyclostomus, Mullus 421
Pseudupeneus 421

PAGE
cylindrica, Parapercis 444
Percis 444
Cyprinidae 390
cyprinoides, Hypseleotris 442
Megalops 386
cypselura, Amia 407
Cypselurus altipennis 393
arcticeps 393
atrisignis 393, 394
bahiensis 394
cribrosus 394
gregoryi 394
naresii 394
nigricans 393
oligolepis 394
oxycephalus 393
poecilopterus 393
rubescens 393
spilopterus 394
cypselurus, Rhabdamia 407
Cypsilurus naresi 394
oligolepis 394

D

Dactyloptena orientalis 431
daemelii, Serranus 410
Dascyllus aruanus 432
carneus 432
marginatus 432
melanurus 432
aruanus var. nigrus 432
polyacanthus 432
trimaculatus 432
dasson, Caranx 405
Dasyatidae 386
Dasyatis granulatus 386
kuhlii 386
sephen 386
dasypogon, Orectolobus 385
Dasyscopelus asper 391
spinosus 391
Datnia argentea 416
micracanthus 416
dayi, Nedystoma 391
Decapterus lajang 403
macrosoma 403
sanctae-helenae 403
decoratus, Calliurichthys 444
delicatula, Echnida 389
delicatulus, Spratelloides 387
Stolephorus 386
Dendrochirus brachypterus 386
chloreus 430
Dentex celebicus 418
ruber 418
deokhata, Syngnathus 397
Desmomanta alfredi 386
devisi, Orectolobus 385
diacanthus, Holacanthus 426
Pygoplites 426
Diacope spilura 413
diadema, Holocentrum 395
Holocentrus 395
Diagramma affine 415
pica 415
punctatum 415
diagrammus, Cheilinus 439
Plectorhinchus 415
Diaphus agassizii 392
anderseni 392
astridae 392
dumerili 392
jenseni 392
nanus 392
parri 392
rafinesquei 392
regani 392
richardsoni 392
schmidti 392
urolampus 392
dickii, Abudefduf 435
didactylum, Pelor 431

PAGE
dimidiatus, Anampses 436
Callyodon 440
Chromis 432
Labroides 436
Pomacentrus 434
dinema, Carangoides 405
Diodon holacanthus 449
hystrix 449
Diodontidae 449
Diplocrepis costatus 447
dispar, Pempheris 412
Zenarchopterus 393
distigma, Eviota 441
djarong, Syngnathus 397
doliata, Teuthis 429
doliatus, Siganus 429
dorsale, Thalassoma 438
dorsalis, Pomacentrus 433
Doryichthys retzii 397
Doryrhamphinarum 397
Drepane punctatus 423
Drombus tutuilae 443
dubius, Callyodon 440
Pseudobatrachus 447
ductor, Naucrates 403
duivenbodii, Gymnothorax 389
Dules argenteus 409
ciliatus 409
guamensis 409
marginatus 409
munda 409
nitens 409
papuensis 409
ruprestris 408
sandvicensis 409
taeniura 409
taeniurus 409
Duleidae 408
dumerili, Caranx 403
Diaphus 392
Seriola 403
dumerilii, Scoliodon 385
duperrey, Thalassoma 438
dussumieri, Hemiramphus 393
Mugil 398
Salarias 446
Thrissocles 387
Dussumieria aluta 387

E

Echelidae 388
Echeneidae 444
Echeneis albescens 444
naucrates 444
remora 444
Echidna delicatula 389
nebulosa 389
polyzona 389
trossula 389
zebra 389
Echidnidae 389
echinocephalus, Paragobiodon 441, 442
Echinorhinidae 386
Echinorhinus cookei 386
ectenes, Tetrapturus 400
edentulus, Leiognathus 406
Salarias 446
edmondsoni, Ichthyocampus 397
elacate, Carangus 404
Caranx 404
Elagatis bipinnulatus 403
elegans, Microsicydium 442
Stiphodon 442
Eleotridae 441
elerae, Chromis 432
Eleutheronema tridactylum 390
Eleotris butis 441
fusca 441
immaculatus 441
melanosoma 441
sandwicensis 441
elongatus, Acanthurus 427
Myxus 399
Elopidae 386

PAGE
Elops hawaiensis 386
machnata 386
saurus 386
Emmelichthyidae 422
Encaeura evides 442
Encheliophis vermicularis 447
Enchelynassa canina 390
Enchelyurus ater 447
endrachtensis, Atherina 398
engeli, Mugil 398
Engraulis 387
australis 387
heteroloba 387
heterolobus 387
mauii 387
scratchleyi 387
engyceros, Peristedion 431
Engyprosopon fijiensis 394
Enneapterygius atriceps 445
hemimelas 445
minutus 445
punctulatus 445
eoume, Naso 428
Ephippidae 423
ephippium, Chaetodon 423
Epibulus insidiator 436
Epinephelus areolatus 410
argus 409
bontoides 410
caeruleopunctatus 411
chlorocephalus 410
fasciatus 410
goldiei 410
hoedtii 410
holdtii 410
leopardus 410
magnificus 410
merra 411
microdon 411
miniatus 410
ongus 411
polystigma 411
sexfasciatus 410
tauvina 411
epiphanes, Eviota 441
equula, Caranx 405
Leiognathus 406
equulaeformis, Gazza 406
equuliformis, Gazza 406
ercodes, Gymnothorax 389
erythracanthus, Lethrinus 417
erythraeus, Holocentrus 395
erythrinus, Mulloidichthys 420
Erythrocles schlegeli 422
erythrodon, Callyodon 440
Odonus 448
erythrogaster, Caesio 415
erythrorinchus, Hemiramphus 393
erythrospilus, Gobiodon 442
erythrurus, Lethrinus 417
Etelis carbunculus 413
marshi 413
Eucrossorhinus 385
eugenius, Gobiomorphus 441
Eulamia melanopterus 385
menisorrah 385
sorrah 385
Euleptorhamphus longirostris 392
viridis 392
Euthynnus alletteratus 400
pelamis 400
Evenchelys macrurus 389
evermanni, Ariomma 403
Cubiceps 403
evides, Encaeura 442
Eviota abax 441
afelei 441
distigma 441
epiphanes 441
smaragdus 441
viridis 441
zonura 441
zonurus 441
Evolantia microptera 393
Exocoetidae 393

PAGE
Exocoetus cribrosa 394
naresii 393
poecilopterus 393
volitans 393
Exonautes rondeletii 394
exostigma, Amia 407
Apogon 407
expansa, Adamia 446

F

faetela, Plectorhinchus 415
falcula, Chaetodon 425
far, Hemiramphus 393
fasciata, Amia 406
fasciatus, Apocryptes 444
Apocryptodon 444
Apogon 406
Chaetodon 424
Cheilinus 439
Epinephelus 410
Hemigymnus 436
Hologymnosus 438
Leiognathus 406
Pomacentrus 434
Salarias 445
favoginea, Lycodontis 390
ferdau, Carangoides 405
ferrugineum, Ginglymostoma 383
fibulatum, Muraena 391
Fierasfer arenicola 447
Fieraster arenicola 447
fijiensis, Engyprosopon 394
filamentosus, Abudefduf 435
Gerres 420
Pristipomoides 413
Pseudupeneus 421
(Hogbina) 421
Serranus 413
Upeneus 421
fimbriata, Clupea (Harengula) 387
Gymnothorax 390
fisheri, Centropyge 426
Holacanthus 426
Fistularia petimba 398
villosa 398
Fistulariidae 398
flavimarginatus, Balistes 448
flavipes, Lutjanus 414
flavirostris, Chaetodon 424
flavissimus, Centropyge 426
Holacanthus 426
flavo-caeruleus, Serranus 410
flavofasciatus, Corythoichthys 397
flavoguttatus, Acanthurus 427
Hepatus 427
flavomarginata, Lycodontis 390
flavomarginatus, Gymnothorax 390
flavovittata, Coris 438
fleurieu, Amia 407
fo, Amia (Foa) 408
fontinalis, Mugilogobius
(Vaimosa) 443
Forcipiger longisrostris 423
formosa, Muraena 390
fornasini, Ostracion 449
forskali, Atherina 398
forskalii, Atherina 398
forsteri, Callyodon 440
Cirrhitus 423
Paracirrhites 423
Sphyraena 399
fowleri, Penetopteryx 397
fraenatus, Lethrinus 417
fragilis, Hymnodus (Seepterias) 408
fratereulus, Pseudupeneus 421
fremblii, Chaetodon 423
frenata, Amia 407
frenatus, Apogon 407
Callyodon 440
froggatti, Arius 391
Tachysurus 391
fuliginosus, Hepatus 427
Terapon 416
Therapon 417
fulvillamma, Lutianus 414
Lutjanus 414
fulvus, Lutianus 414
Lutjanus 414
furcatus, Aphareus 413
Holocentrus 395
furcosus, Synagris 418
fusca, Eleotris 441
fuscescens, Serranus 410
Siganus 429
fuscoguttatus, Serranus 411
fuscus, Bathygobius 442
Kyphosus 419
Pseudochromis 412
Pseudochromis
(Pseudochromis) 412
Salarias 445

G

Gadus leveriana 399
galum, Acanthurus 427
gaimard, Coris 438
galena, Scarus 440
Galeocerdo arcticus 385
Galeorhinidae 385
Gazza equulaeformis 406
equuliformis 406
minuta 406
gembra, Lutjanus 414
gemmeus, Gnatholepis 443
Gempylidae 400
Genicanthus lamarck 426
genivittatus, Chonophorus 443
georgii, Hemiramphus 393
Germo albacores 400
macropterus 400
sibi 400
Gerreomorpha 419
setifera 419
setigera 419
Gerres 419
abbreviatus 419
acinaces 419
argyreus 419
baconensis 419
filamentosus 420
gigas 419
kapas 419
lucidus 419
macracanthus 420
macrosoma 419
oblongus 419
ovatus 419
oyena 419
poieti 419
punctatus 420
setifer 419
Gerridae 419
ghobban, Callyodon 441
gibber, Coryphaenoides 394
Macrurus 394
gibbifrons, Salarias 446
gibbosus, Scorpaenopsis 429
gibbus, Lutianus 414
Lutjanus 414
Giffordella corneliae 445
gigas, Ambassis 408
Gerres 419
gilberti, Gymnothorax 389
Ginglymostoma ferrugineum 385
Girellidae 419
Girella nebulosa 419
glaucopareius, Acanthurus 427
Hepatus 427
glaucus, Abudefduf 435
Glossogobius biocellatus 443
circumspectus 443
concavifrons 443
glyphisodon antjerius 435
brownriggi 435
coelestinus 434
leucogaster 435
leucopleurus 434
nigrifrons 435
notatus 435
sordidus 434
trifasciatus 435
uninaculatus 435
Glyphisodon binaculatus 436
breviceps 433
coelestinus 434
hedleyi 435
leucogaster 435
sordidus 434
glyphodon, Lethrinus 417
Gnathanodon 405
speciosus 405
Gnatholepis anjerensis 443
corlettei 443
gemmeus 443
puntang 443
puntangoides 442
Gobiesocidae 447
Gobiichthys lonchotus 444
Gobiidae 442
Gobiodon citrinus 442
erythrospilus 442
quinquestrigatus 442
rivulatus 442
verticalis 442
Gobiomorphus eugenius 441
Gobius baliuroides 443
circumspectus 443
concavifrons 443
maculipinnis 442
ornatus 443
puntang 442
puntangoides 442
godeffroyi, Anampses 436
goldiei, Aeschrichthys 399
Aristeus 398
Cestraeus 399
Epinephelus 410
Mesoprion 415
Rhombosoma 398
Serranus 410
goldmanni, Plectorhinchus 415
Gomphosus coeruleus 438
tricolor 438
varius 438
gracilis, Jordanicus 447
Saurida 391
Synagris 418
graeffii, Mionorus 407
grammatica, Makaira 400
Grammistes orientalis 411
sexlineatus 411
grandisquamis, Saurida 391
grandoculis, Monotaxis 418
Paragoboides 444
Upeneus cinnaborinus 421
granulata, Himantura 386
Trygon 386
granulatus, Dasyatis 386
Rhinobatos 386
gregoryi, Cypselurus 394
guamensis, Chonophorus 443
Dules 409
Scorpaena 429
Scorpaenodes 429, 430
Guavina gyrinoides 441
guildi, Semathunnus 400
gulliveri, Kurtus 406
güntheri, Nemipterus 418
guttatus, Callyodon 441
Hepatus 427
Salarias 445
guttulatus, Coryzichthys 447
Gymnocaesio argenteus 415
gymnocephalus, Ambassis 408
Halichoeres 437
Gymnomuraena concolor 390
marmorata 390
gymnostethoides, Carangoides 405
gymnostethus, Carangoides 405
Gymnothorax chilospilus 390
concolor 390
cribroris 390
duivenbodii 389
ereodes 389

PAGE
fimbriata 390
flavomarginatus 390
gilberti 389
mindanoensis 390
nebulosus 389
pictus 389
punctato-fasciatus 390
reticularis 390
richardsoni 390
ruppellii 390
steindachneri 390
stellatus 390
undulatus 390
Gymnura 386
bimaculata 386
crebripunctata 386
japonica 386
marmorata 386
micrura 386
poecilura 386
gyrinoides, Guavina 441

H

habbemai, Therapon 416
haematopterus, Lethrinus 417
Halichoeres argus 437
binotopsis 437
centriquadrus 437
daedalma 437
gymnocephalus 437
hoeveni 437
hoevenii 437
leparensis 437
leucurus 437
margaritaceus 437
melanurus 437
miniatus 437
nebulosus 437
notopsis 437
opercularis 437
purpurascens 437
scapularis 437
trimaculatus 437
Halicoeres centriquadrus 437
hoevenii 437
hamrur, Priacanthus 412
hamrus, Priacanthus 412
harak, Lethrinus 417
hardwicke, Thalassoma 438
Harengula melanura 387
moluccensis 387
punctata 387
hartzfeldi, Apogon 406
hartzfeldii, Amia 406
hasseltii, Callogobius 443
hasta, Chrysophrys 418
Pomadasys 415
hawaiensis, Elops 386
hawaiiensis, Chaetodon setifer var. 424
Malacocephalus 394
hedleyi, Abudefduf 435
Glyphisodon 435
Helotes lorentzi 417
Hemiglyphidodon plagiometopon 436
Hemigymnus fasciatus 436
melapterus 436
hemimelas, Enneapterygius 445
Hemipimelodus crassilabris 391
Hemipteronotus melanops 439
pentadactylus 439
Hemiramphidae 392
Hemiramphus affinis 393
argenteus 393
balinensis 393
brasiliensis 393
cuspidatus 393
dussumieri 393
erythrorinchus 393
far 393
georgii 393
longirostris 392
pacificus 392
pietschmanni 393
praematurus 393

PAGE
quoyi 393
viridis 392
Hemiscyllium ocellatum 385
Heniochus acuminatus 425
chrysostomus 425
permatatus 425
permutatus 425
varius 425
Hepatidae 426
Hepatus achilles 427
elongatus 427
flavoguttatus 427
fuliginosus 427
glaucopareius 427
guttatus 427
leucosternon 427
lineatus 427
lineolatus 427
nigricans 427
olivaceus 427
sandvicensis 427
triostegus 426
Hepsetia insularum 398
lacunosa 398
ogilbyi 398
pinguis 398
heptacanthus, Apogon 407
heteroloba, Engraulis 387
heterolobus, Anchoviella 387
Heteropyge navarchus 425
sexstriatus 425
xanthometopon 425
hexagonatus, Serranus 411
Teuthis 429
hexagonus, Myripristis 396
hexataenia, Pseudocheilinus 439
hexophthalma, Parapercis 444
hians, Ablennes 392
Myctophum 392
Himantura granulata 386
Hippocampus kuda 397
hispidus, Tetrodon 449
Histrio histrio 450
histrio, Histrio 450
hoedti, Ophiocara 441
hoedtii, Epinephelus 410
Ophiocara 441
hoeveni, Halichoeres 437
Platyglossus 437
hoevenii, Halichoeres 437
Halichoeres 437
Holacanthus arcuatus 426
bispinosus 426
diacanthus 426
fisheri 426
flavissimus 426
imperator 425
loriculus 426
multispinis 426
navarchus 425
nicobariensis 425
bicolor var. oahuensis 425
potteri 426
semicirculatus 425
sexstriatus 425
uniocellatus 426
vroliki 426
vrolikii 426
xanthometopon 425
holacanthus, Diodon 449
holdtii, Epinephelus 410
hollandi, Myctophum 392
Holocentridae 394
Holocentrum argenteum 395
cornutum 395
diadema 395
lacteoguttatum 395
sammara var. laeve 395
microstoma 395
operculare 396
rubrum 394
sammara 396
tieroides 395
violaceum 395

PAGE
Holocentrus binotatus 395
caudimaculatus 395
cornutus 395
diadema 395
erythraeus 395
furcatus 395
lacteoguttatus 395
lacteo-guttatus 395
laevis 395
malabaricus 411
microstomus 395
opercularis 396
rubellio 395
ruber 394
sammara 395
spinifer 395
tiereoides 395
unipunctatus 395
violaceus 395
xantherythrus 395
Hologymnosus fasciatus 438
semidiscus 438
Holotrachys lima 396
homei, Carapus 447
hookeri, Prymonothonus 390
Prymonothorus 390
Hoplichthyidae 431
Hoplichthys citrinus 431
horridum, Synancidium 431
howlandi, Serranus 410
huysmani, Sphagebranchus 388
hyalosoma, Amia 407
Apogon 407
Hynnodus atherinoides 408
(Scepterias) fragilis 408
Hypseleotris cyprinoides 442
diadematus 442
hypselogenion, Spheroides 449
Sphoeroides 449
hypselonotus, Amia 407
hypselopterus, Lethrinus 417
Pisodonophis 388
hysmani, Muraenichthys 388
hystrix, Diodon 449

I

Ichthyocampus edmondsoni 397
kampeni 397
ignobilis, Caranx 404
illingworthi, Tetrapterus 400
immaculatus, Eleotris 441
Tetrodon 449
imperator, Holacanthus 425
Pomacanthus 425
inana, Bryanina 442
incisa, Strongylura 392
indica, Anchoviella 387
Scyris 405
Strongylura 392
indicus, Alectis 405
Polynemus 399
Pseudupeneus 420
inermis, Cheilio 439
Tetrodon 449
Inustius niger 439
pavo 439
pavoninus 439
inornatus, Pomacentrus 434
insidiator, Epibulus 436
insignis, Amblygobius 444
insipiens, Acanthurus 428
insolitus, Pomacentrus 433
insularum, Anchoviella 387
Atherina 398
Hepsetia 398
Stolephorus 387
intermedius, Myripristis 396
interrupta, Ambassis 408
intestinalis, Corythoichthys 397
Syngnathus 397
iomelas, Chromis 432
irroratus, Salarias 446
ishikawai, Caranx 404
Istiompax australis 400
Istiophoridae 400

PAGE
Istiophorus brookei 400, 401
orientalis 400
Isistius, brasiliensis 386
itosibi, Semathunnus 400

J

jaculator, Toxotes 423
jenseni, Parupeneus 422
jansenii, Pseudupeneus 422
janthinopterus, Canthigaster 449
japonica, Gymnura 386
japonicus, Stolephorus 386
Synodus 391
jarbua, Terapon 416
Therapon 416
jarra, Caranx 405
javanica, Ratabonra 389
javanicus, Aphthalmichthys 389
javus, Siganus 428
jeffi, Pseudupeneus 422
jello, Sphyraena 399
jenseni, Diaphus 392
johni, Lutianus 413
johnii, Lutjanus 413
Johnius axillaris 422
papuensis 422
jordani, Trachynotus 405
Jordanicus gracilis 447
parvipinnis 447
umbratilis 447
jussieu, Sardinella 387

K

kailuae, Muraena 389
kalla, Caranx 404
kallopterus, Lethrinus 417
kalosoma, Amia 407
Apogon 407
kampeni, Achirophichthys 389
Brachysomophis 389
Ichthyocampus 397
Zenarchopterus 393
kanagurta, Scomber 399
kapas, Gerres 419
kasmira, Lutianus 413
katoptron, Anomalops 394
kellersi, Salarias 445
kelloggi, Scorpaenodes 430
Sebastopsis 430
kendalli, Cephalopholis 409
kidako, Lycodontis 390
kitlitzii, Cheilinus 439
kleinii, Chaetodon 424
kneri, Terapon 416
knighti, Anarchias 390
koebreuteri, Periophthalmus 444
krausi, Scarus 440
kraussi, Tetrapturus 400
kuhlii, Caranx 404
Dasyatis 386
Selar 404
Kuhlia argenteus 409
marginata 409
munda 409
rupestris 408
taeniura 409
kulambangrae, Petroscirtes 445
kumu, Chelidonichthys 431
Trigla 431
Kurtidae 406
Kurtus gulliveri 406
Kyphosidae 419
Kyphosus bigibbus 419
cinerascens 419
fuscus 419
sandwicensis 419
vaigiensis 419

L

labiatus, Pomacentrus 432
labiosus, Mugil 399
Labrichthys cyanotaenia 436
Labridae 436
Labroides dimidiatus 436

PAGE
Labrus leucurus 437
lacrymatus, Abudefduf 435
lacteoguttatum, Holocentrum 395
lacteoguttatus, Holocentrus 395
lacteo-guttatus, Holocentrus 395
lacunosa, Hepsetia 398
laeve, Holocentrum sammara var. 395
laevis, Holocentrus 395
lafa, Ambassis 408
lagocephalus, Sphoeroides 449
lajang, Decapterus 403
lamarck, Genicanthus 426
Lampridae 394
Lampris regius 394
lanceolatus, Masturus 450
Scomber 400
lasulinus, Callyodon 440
laterale, Amia 407
lateralis, Apogon 407
Lates calcarifer 409
latirostris, Arius 391
Tachysurus 391
latovittatus, Malachanthus 422
latus, Carangus 404
Lebistes reticulatus 392
Leiognathidae 406
leiognathos, Myripristis 396
Leiognathus edentulus 406
equula 406
fasciatus 406
smithursti 406
Leiuranus 388
lentiginosum, Ostracion 449
lentiginosus, Ostracion 449
leonina, Scorpaenopsis 429
leopardus, Cephalopholis 410
Epinephelus 410
leparensis, Halichoeres 437
Platyglossus 437
Lepidaplois bilunulatus 436
perdito 436
lepomis, Coris 438
Leptecheneis naucrates 444
Leptobrama mülleri 412
Leptocephalus conger 388
manokwariensis 388
marginatus 388
schmidti 388
taenia 388
Leptojulis pardalis 437
leptolepis, Caranx 405
Leptoscarus brachysomus 439
vaigiensis 440
Lethrinidae 417
Lethrinus amboinensis 417
cocosensis 417
erythracanthus 417
erythrurus 417
fraenatus 417
glyphodon 417
haematopterus 417
harak 417
hypselopterus 417
kallopterus 417
leutjanus 417
mahsena 417
mahsenoides 417
miniatus 417
nebulosus 417
olivaceus 418
opercularis 417
ornatus 417
ramak 417
reticulatus 417
richardsoni 417
rostratus 417
rostris specificus 417
variegatus 417
waigiensis 418
xanthotaenia 417
leuciscus, Myxus 399
leucogaster, Abudefduf 435
Glyphidodon 435
leucogrammicus, Amyperodon 411
leucopleurus Glyphidodon 434

PAGE
leucopomus, Abudefduf 435
leucosternon, Acanthurus 427
Hepatus 427
leucostictus, Cryptocentrus 444
leucotaenia, Scolopsis 416
leucozonus, Abudefduf 435
leucurus, Halichoeres 437
Labrus 437
leveriana, Gadus 399
Sphyraena 399
lima, Holotrachys 396
lineata, Teuthis 429
lineatus, Acanthurus 427
Amphacanthus 429
Balistapus 448
Cheilodipterus 408
Hepatus 427
Lutianus 414
Lutjanus 414
Salarias 446
Siganus 429
lineolata, Archamia 408
lineolatus, Chaetodon 424
Hepatus 427
Oxyeleotris 441
liognathus, Myripristis 396
littoralis, Pomacentrus 433
lituratus, Callicanthus 428
Naso 428
lividus, Pomacentrus 433
Liza caeruleomaculata 399
melinoptera 398
oligolepis 399
sepeli 399
vaigiensis 398
Lobotes surinamensis 413
Lobotidae 413
lonchotus, Gobiichthys 444
longimanus, Mugil 398
longipes, Caranx 405
longipinnis, Priacanthus 412
longirostris, Euleptorhamphus 392
Forcipiger 423
Hemiramphus 392
Oxymonacanthus 448
longispinus, Amblyapistus 431
Apistus 431
longulus, Scolopsis 416
loo, Scomber 399
lorentzi, Helotes 417
loriculus, Centropyge 426
Holacanthus 426
lucidus, Gerres 419
lugubris, Caranx 404
lunare, Thalassoma 438
lunaris, Caesio 415
lunula, Chaetodon 424
lurida, Ariomma 403
lutea, Coryphaena 418
lutescens, Thalassoma 438
luteus, Pseudupeneus 421
Synagris 418
Upeneus 421
Lutianus argentimaculatus 414
biguttatus 413
bohar 413
chrysotaenia 413
fulviflamma 414
fulviflammus 414
fulvus 414
gibbus 414
johni 413
kasmira 413
lineatus 414
lioglossus 414
malabaricus 414
marginatus 414
monostigma 414
niger 414
oligolepis 414
rivulatus 414
russelli 414
semicinctus 413
vitta 413
Lutjanidae 413

PAGE
Lutjanus argentimaculatus 414
biguttatus 413
bohar 413
chrysotaenia 413
flavipes 414
fulviflamma 414
fulvus 414
gembra 414
gibbus 414
johnii 413
kasmira 413
lineatus 414
malabaricus 414
monostigma 414
parvidens 414
rivulatus 414
rubens 414
semicinctus 413
spilurus 413
vaigiensis 414
vitta 413
Lycodontis chilospila 390
cribroris 390
favaginea 390
flavomarginata 390
kidako 390
meleagris 389
mindanoensis 390
nudivomer 390
picta 389
punctato-fasciatus 390
reticularis 390
richardsonii 390
rupelli 390
ruppelli 390
undulata 390
Lycogenis 416
lysan, Chorinemus 403
Scomberoides 403

M

Macgregorella santa 443
machnata, Argentina 386
Elops 386
macneilli, Salarias 446
Macolor niger 414
macracanthus, Gerres 420
Priacanthus 412
macrocephala, Rataboura 389
macrocephalus, Uropterygius 390
macrochir, Rataboura 389
Macrognathus armatus 447
marmoratus 447
macrolepidotus, Novaculichthys 439
Ophiocara 441
macrolepis, Mugil 399
Sillago 422
macronema, Upeneus 420
macronemus, Pseudupeneus 420
macrophthalmus, Scolopsis 415
Selar 403
Trachurops 403
macrops, Thrissocles 387
macropterus, Germo 400
Neothynnus 400
macrosoma, Decapterus 403
Gerres 419
macrura, Muraena 389
macrurus, Evenchelys 389
Macrurus gibber 394
maculata, Muraena 388
maculatus, Caracanthus 431
Plectropomus 409
Serranus 410
maculifera, Amia 407
maculipinnis, Gobius 442
maculosus, Myrichthys 388
Macurrhynchus maroubrae 445
magnificus, Epinephelus 410
Serranus 410
mahsena, Lethrinus 417
mahsenoides, Lethrinus 417
major, Chrysophrys 418
Makaira australis 400, 402
grammatica 400

PAGE
malabaricus, Carangoides 405
Caranx 405
" (Caranx) 405
Holocentrus 411
Lutianus 414
Lutjanus 414
Parupeneus 421
Scomber 405
Serranus 441
Sparus 414
Upeneus 421
Malacanthidae 422
Malacanthus latovittatus 394
Malacocephalus hawaiiensis 394
malekulae, Rhinogobius 443
Malthopsis mitriger 450
manadensis, Microphis 397
mancus, Platophrys 394
mandibularis, Ulua 405
mangula, Pempheris 412
manokwariensis, Leptocephalus 388
Manta 386
alfredi 386
birostris 386, 444
mappa, Tetrodon 449
margaritaceus, Anthias 411
Halichoeres 437
margaritatus, Canthigaster 449
margaritifer, Chelidoperca 411
Scolopsis 415
margaritiferus, Amphacanthus 428
marginata, Kuhlia 409
marginatus, Dascyllus 432
Dules 409
Leptocephalus 388
marianensis, Carcharias 385
marmorata, Gymnomuraena 390
Teuthis 429
marmoratus, Antennarius 450
Blennius 445
Cirrhites 423
Cirrhitichthys 422
Cirrhitus 422
Macrognathus 447
Nandus 422
Salarias 445
Uropterygius 390
maroubrae, Aspidontus 445
Macrurrhynchus 445
marquesensis, Sicyopterus 442
marshi, Etelis 413
Mastacembelidae 447
Mastacembelus armatus 447
Masturus lanceolatus 450
mataafae, Micrognathus 397
Mataeocephalus acipenserinus 394
mate, Caranx 404
" (Selar) 404
matoides, Acanthurus 427
mauii, Engraulis 387
mauritiana, Anguilla 387, 388
Muraena 387, 388
mazara, Tetrapturus 400
mcclellandi, Bregmaceros 394
mcclellandii, Bregmaceros 394
mccullochi, Pseudochromis 412
Megalaspis cordyla 403
Megalops cyprinoides 386
Megaprotodon strigangulus 425
Melamphaes crassiceps 394
Melamphaidae 394
melampygos, Caranx 404
melampygus, Carangus 404
Caranx 404
" (Caranx) 404
melannotus, Chaetodon 424
melanocephalus, Monacanthus 448
melanochir, Thalassoma 438
melanogenion, Parexocoetus 393
Ptenotus 393
melanopleura, Microphis 397
melanops, Hemipteronotus 439
melanopterus, Carcharias 385
Eulamia 385

PAGE
melanopus, Amphiprion 431
Melanotaenia rubrostriatus 398
melanotus, Tylosurus 392
melanura, Clupea 387
Harengula 387
Sardinella 387
melanurus, Dascyllus 432
Halichoeres 437
Platyglossus 437
melapterus, Hemigymnus 436
melas, Amia 407
Apogon 407
Plesiops 411
meleagris, Lycodontis 389
Tetrodon 449
Melichthys buniva 448
melinoptera, Liza 398
menisorrah, Eulamia 385
merra, Epinephelus 411
Serranus 410, 411
mesoleucus, Chaetodon 425
Chaetodontoplus 425
Mesoprion goldiei 415
metallicus, Abudefduf 435
micracanthus, Datnia 416
Terapon 416
Microcanthus strigatus 425
microcheilos, Callyodon 440
microchilus, Callyodon 440
microchir, Moringua 389
microdon, Epinephelus 411
Pristipomoides 413
Micrognathus balli 397
brevirostris 397
mataafae 397
microlepis, Pristipomoides 413
Microphis brachyurus 397
manadensis 397
melanopleura 397
microphthalmus, Myripristis 396
Micropis zeylonicus 431
microps, Callionymus 444
Synchirops 444
microptera, Evolantia 393
microrhinos, Callyodon 440
Microsicydium elegans 442
microstoma, Holocentrum 395
microstomus, Holocentrus 395
miliaris, Chaetodon 424
mindanoensis, Gymnothorax 390
Lycodontis 390
miniatus, Cephalopholis 410
Epinephelus 410
Halichoeres 437
Lethrinus 417
minuta, Gazza 406
Mionorus graeffii 407
miops, Ambassis 408
Misgurnis anguillicaudatus 391
mitriger, Malthopsis 450
mitsukurii, Tetrapturus 400
moana, Upeneus 421
moensi, Callyodon 440
Pseudoscarus aff. 440
Mobulidae 386
Molidae 450
moluccensis, Harengula 387
Pomacentrus 433
Monacanthidae 448
Monacanthus melanocephalus 448
spilosoma 448
tomentosus 448
monoceros, Alutera 448
Monodactylidae 423
Monodactylus argenteus 423
monostigma, Lutianus 414
Lutjanus 414
Monotaxis grandoculis 418
mooreanus, Myripristis 396
moorensis, Anthias 411
moresbyensis, Caranx 404
Moringua abbreviata 389
microchir 389

PAGE
Moringuidae 389
mortoni, Anthias 411
Mugil borneensis 399
carinatus 399
cephalus 399
compressus 399
crenilabis 399
cunnesius 398
dussumieri 398
engeli 398
labiosus 399
longimanus 398
macrolepis 399
oeur 399
oligolepis 399
papillosus 399
seheli 399
thoburni 399
trichilus 398
troscheli 399
vaigiensis 398
Mugilidae 398
Mugilogobius (Vaimosa) fontinalis 443
mulleri, Brotula 447
mülleri, Leptobrama 412
Mullidae 420
Mulloides auriflamma 420
flammeus 420
samoensis 420
Mulloidichthys auriflamma 420
erythrinus 420
pflugeri 420
samoensis 420
vanicolensis 420
Mullus bensasi 422
cyclostomus 421
multibarbis, Choridactylus 431
multifasciatus, Pseudupeneus 421
Scatophagus 423
Upeneus 420, 421
multispinis, Centropyge 426
Holacanthus 426
multitaeniatus, Amia 407
Apogon 407
Muraena australis 388
buroensis 390
catenata 390
celebesensis 388
formosa 390
kailuae 389
macrura 389
maculata 388
mauritiana 387, 388
reinhardti 387
Muraenidae 387
Muraenesocidae 388
Muraenesox cinereus 388
Muraenichthys huysmani 388
Muraenophis pardalis 389
muralis, Valenciennes 442
Muroenesocidae 388
Muroenesox arabicus 388
talabonoides 388
murdjan, Myripristis 396
murjan, Myripristis 396
mutabilis, Callyodon 440
munda, Dules 409
Kuhlia 409
Myctophidae 391
Myctophum affine 391
andreae 391
asper 391
aurolaternatum 391
cocco 392
crenulare 391
fibulatum 391
hians 392
hollandi 392
nigro-ocellatum 391
pristilepis 391
pterotum 392
reinhardti 392
spinosus 391
tenuiculum 392

PAGE
myersi, Amblygobius 444
Myliobatidae 386
myops, Trachinocephalus 391
Myrichthys colubrinus 388
maculosus 387
Myripristis adustus 396
bleekeri 396
carneus 396
hexagonus 396
intermedius 396
leiognathos 396
liognathus 396
microphthalmus 396
mooreanus 396
murdjan 396
murjan 396
pahudi 396
parvidens 396
pralinius 396
praslinius 396
sanguineus 396
symmetricus 396
trachyacron 396
violaceus 396
mystax, Thrissocles 387
Myxus elongatus 399
leuciscus 399

N

Nandidae 422
Nandus marmoratus 422
nandus 422
nandus, Nandus 422
nanus, Diaphus 392
naresii, Cypselurus 394
Exocoetus 393
narinari, Aetobatus 386
Naso annulatus 428
brevirostris 428
eoume 428
lituratus 428
tuberosus 428
unicornis 428
nasus, Chatoessus 387
nasutus, Therapon 416
Naucrates ductor 403
naucrates, Echeneis 444
heptecheneis 444
navarchus, Heteropyge 425
Holacanthus 425
nebulosa, Echidna 389
Girella 419
Saurida 391
nebulosus, Gymnothorax 389
Lethrinus 417
Pseudochromis 412
Rhinogobius 443
Nedystoma dayi 391
Nematocentrus rubrostriatus 398
Nemipterus güntheri 418
robustus
nemoptera, Amia 403
nemurus, Synagris 418
Neomyxus chaptalii 399
neophytus, Rhinogobius 443
Neothunnus macropterus 400
nephodes, Opua 443
Nesiotes purpurascens 412
nicobariensis, Holacanthus 425
niger, Iniistius 439
Lutianus 414
Macolor 414
Plectorhinchus 415
nigricans, Cypselurus 393
Hepatus 427
Plesiops 411
Pomacentrus 433
nigrifrons, Glyphidodon 435
nigro-ocellatum, Myctophum 391
nigro-ocellatus, Scopelus 391
nigrum, Pristipoma 415
nigrus, Dascyllus aruanus var. 432
Plectorhinchus 415
nitens, Dules 409

PAGE
nitidus, Salarias 445
niuafoouensis, Salarias 446
notatus, Abudefduf 435
Glyphidodon 435
notophthalmus, Pomacentrus 433
notopsis, Halichoeres 437
Platyglossus 437
Novacula taeniurus 439
Novaculichthys macrolepidotus 439
taeniourus 439
taeniourus 439
novae caledoniae, Zebrasoma veliforum 428
novae guineae, Caranx 405
Scorpaena 429
Scorpaenopsis 429
novemfasciata, Amia 406
novemfasciatus, Apogon 406
nox, Centropyge 426
Holacanthus 426
nuchipunctatus, Callyodon 441
nudivomer, Lycodontis 390
nummifer, Antennarius 450

O

oahuensis, Holacanthus bicolor var. 425
oblongus, Carangoides 405
Caranx 405
Gerres 419
obscura, Anguilla 388
obscurus, Balistapus aculeatus var. 448
ocellaris, Chonophorus 443
ocellatus, Hemiscyllium 385
ocellicauda, Chaetodon 424
ocellicaudatus, Chaetodon 424
octofasciatus, Chaetodon 424
Odonus erythrodon 448
oeur, Mugil 399
ogilbyi, Hepsetia 398
Pranasus 398
oligacanthus, Chaerops 436
Crenilabrus 436
Plectropomus 409
oligolepis, Cypselurus 394
Cypsilurus 394
Liza 399
Lutianus 414
Mugil 399
olivaceus, Hepatus 427
Lethrinus 418
ongus, Epinephelus 411
operculare, Holocentrum 396
Pristipoma 415
opercularis, Halichoeres 437
Holocentrus 396
Lethrinus 417
Pomadasys 415
Ophichthus apicalis 388
calamus 389
polyophthalmus 389
Ophichthyidae 388
Ophichthys (Callechelys) punctulatus 389
Ophiocara aporos 441
hoedti 441
hoedtii 441
macrolepidotus 411
ophiocephalus 441
porocephalus 441
ophiocephalus, Ophiocara 441
Ophisurus apicalis 388
serpens 388
spadiceus 388
Opua nephodes 443
oramin, Amphacanthus guttatus var. 429
Siganus 429
orbicularis, Amia 406
Apogon 406
Orectolobidae 385

PAGE
Orectolobus 385
dasypogon 385
devisi 385
ornatus 385
orientalis, Anthias 415
Dactyloptena 431
Grammistes 411
Istiophorus 400
Plectorhinchus 415
Pleuronectes 394
Pseudupeneus 421
Scomberoides 403
Synaptura 394
Thunnus 400
Thynnus 400
ornatissimus, Chaetodon 423
ornatum, Scyllium 385
ornatus, Crossorhinus 385
Gobius 443
Lethrinus 417
Orectolobus 385
Ostraciidae 448
Ostracion cornutus 449
cubicus 448
fornasini 449
lentiginosum 449
lentiginosus 449
punctatus 449
sebae 448
tuberculatus 448
otaitensis, Pempheris 412
oualensis, Pempheris 412
ovatus, Trachinotus 405
Trachynotus 405
oviceps, Callyodon 440
ovoides, Pomacentrus 433
oxycephalus, Cirrhitichthys 423
Cirrhitus 423
Cypselurus 393
Oxycirrhites (Cirrhitoidea) bimacula 422
Oxyeleotris lineolatus 441
Oxymonacanthus longirostris 448
Oxyporhamphus argenteus 393
oxyrhynchus, Cheilinus 439
oyena, Gerres 419

P

pachycentron, Cephalopholis 409
pachycentrum, Cephalopholis 409
pacificus, Hemiramphus 392
Pagrosomus auratus 418
pahudi, Myripristis 396
palpebratus, Anomalops 394
pan, Synaptura 394
pantherina, Scuticaria 390
pantherinus, Bothus 394
Platophrys 394
Papenua pugnans 442
papillosus, Mugil 399
papuensis, Amphiprion 431
Balistes 448
Clupeoides 387
Corica 387
Dules 409
Johnius 422
Paracanthistius 409
Paracirrhites arcatus 423
cinctus 423
forsteri 423
paradiseus, Pentapus 418
Paragobiodon echinocephalus 442, 444
Paragoboides grandoculis 444
Paraluteres prionurus 448
Paramyrus kellersi 388
Parapegasus volitans 398
Parapercidae 444
Parapercis cylindrica 444
hexophthalma 444
schauinslandii 445
tetracanthus 445
Parapocryptes serperaster 444
Parathunnus sibi 400
Pardachirus pavoninus 394
pardalis, Cantherines 448
Leptojulis 437
Muraenophis 389
Parexocoetus 393
brachypterus 393
cirriger 393
melanogenion 393
rostratus 393
parri, Diaphus 392
Parupeneus barberinus 420
chryserydris 421
indicus 420
janseni 422
malabaricus 421
spilurus 420
trifasciatus 421
parvidens, Lutjanus 414
Myripristis 396
parvipinnis, Carapus 447
Jordanicus 447
pavo, Iniistius 439
Pomacentrus 432
pavoninus, Iniistius 439
Pardachirus 394
pectoralis, Callyodon 440
Pseudoscarus 440
Pegasidae 398
Pegasus volitans 398
pelamis, Euthynnus 400
Pelates quadrilineatus 416
romeri 416, 417
Pelecanichthys crumenalis 394
pelewensis, Chaetodon 423
Pelor didactylum 431
Pempheridae 412
Pempheris dispar 412
mangula 412
otaitensis 412
oualensis 412
vanicolensis 412
woodlarkensis 412
Penetopteryx fowleri 397
pentadactylus, Hemipteronotus 439
Pentapodus aurolineatus 418
caninus 418
setosus 418
Pentapus aurolineatus 418
caninus 418
paradiseus 418
pleurostictus 418
Perca rogaa 410
summana areolata 410
Percis cancellata 444
cylindrica 444
Percoides 415
pica 415
percula, Amphiprion 431
perdito, Lepidaplois 436
perdix, Apogonichthys 428
Periopthalmus barbarus 444
koelreuteri 444
koelreuteri argentilineatus 444
periophthalmus, Salarias 446
Peristediidae 431
Peristedion engyceros 431
permatatus, Heniochus 425
persimilis, Asseraggodes 394
Solea 394
perspicillatus, Callyodon 440
Clinus 445
petimba, Fistularia 398
Petroscirtes kulambangrae 445
pfeifferi, Polydactylus 399
Polynemus 399
pflugeri, Mulloidichthys 420
phalaena, Amblygobius 444
phekadopleura, Stethojulis 436
pholis, Blennius 445
pica, Diagramma 415
Percoides 415
picta, Scorpaena 429
pictus, Gymnothorax 389
Plectorhinchus 415
pietschmanni, Hemiramphus 393
Pimelepterus cinerascens 419
pinchoti, Benthasema 392
pinguis, Hepsetia 398
pinnatus, Platax 423
pinnulatus, Cirrhitus 422
piscatoria, Tephrosa 428
Pisodonophis boro 388
cancrivorus 388
hypselopterus 388
plagiometopon, Hemiglyphidodon 436
Platacidae 423
Platax pinnatus 423
platessa, Caranx 405
Caranx (Longisrostrum) 405
Platophrys mancus 394
panterinus 394
pantherinus 394
Platycephalidae 431
Platyglossus hoeveni 437
leparensis 437
melanurus 437
notopsis 437
platyrhynchus, Coelonotus 396
platyura, Belone 392
plebeius, Chaetodon 425
Polydactylus 399
Polynemus 399
Plectorhinchus 415
albovittatus 415
celebicus 415
chaetodonoides 415
crassispinis 415
diagrammus 415
faetela 415
goldmanni 415
niger 415
nigrus 415
orientalis 415
pictus 415
polytaenia 415
radja 415
unicolor 415
Plectropomus 409
leopardus 409
maculatus 409
oligacanthus 409
Plesiops melas 411
nigricans 411
Pleuronectes orientalis 394
Pleuronectidae 394
pleurospilos, Upeneus 421
pleurostictus, Pentapus 418
pleurostigma, Pseudupeneus 420
pleurotaenia, Anthias 411
plicatilis, Cestraeus 399
Plotosidae 391
Plotosus anguillaris 391
arab 391
Poeciliidae 392
poeciloptera, Amia 406
poecilopterus, Apogon 406
Cypselurus 393
Exocoetus 393
poecilura, Gymnura 386
Pteroplatea 386
poieti, Gerres 419
polyacanthus, Acanthochromis 432
Dascyllus 432
Pseudogramma 412
Polydactylus indicus 399
pfeifferi 399
plebeius 399
Polynemus indicus 399
pfeifferi 399
plebeius 399
tridactylus 399
polymnus, Amphiprion 431
Polynemidae 399
polyophthalma, Caecula 389
polyophthalmus, Caecula 389
Ophichthus 389
Sphagebranchus 389
polystigma, Apogonichthys 408
Epinephelus 411
polytaenia, Plectorhinchus 415
polyzona, Echidna 389

PAGE
Pomacanthus imperator 425
semicirculatus 425
Pomacentridae 431
Pomacentrus albofasciatus 434
amboinensis 434
bifasciatus 434
biocellatus 433
breviceps 433
caeruleus 433
cranei 433
dimidiatus 434
dorsalis 433
fasciatus 434
inornatus 434
insolitus 433
labiatus 432
littoralis 433
lividus 433
melanopterus 433
moluccensis 433
nigricans 433
notophthalmus 433
ovoides 433
pavo 432
prosopotaenia 433
punctatus 433
rectifraenum 432
rhodonotus 434
(Pseudopomacentrus) rhodonotus 434
semifasciatus 434
simsiang 433
sufflavus 434
suvarovensis 434
trilineatus 433
tripunctatus 433
tropicus 433
vaiuli 433
violescens 433
Pomadasidae 414
Pomadasyidae 414
Pomadasys hasta 415
opercularis 415
Pontinus spilistius 430
porocephalus, Ophiocara 441
porphyreus, Pseudupeneus 421
potteri, Centropyge 426
Holacanthus 426
praematurus, Hemiramphus 393
pralinius, Myripristis 396
Pranasus ogilbyi 398
Premnas biaculeatus 431
pretiosus, Ruvettus 400
Priacanthidae 412
Priacanthus boops 412
cruentatus 412
hamrur 412
hamrus 412
longipinnis 412
macracanthus 412
prionurus, Paraluteres 448
Priopis buruensis 408
pristilepis, Myctophum 391
Pristipoma nigrum 415
operculare 415
Pristipomoides argyogrammicus 413
filamentosus 413
microdon 413
microlepis 413
sieboldii 413
typus 413
Pristotis violescens 433
prometheus, Promethichthys 400
Promethichthys prometheus 400
proridens, Chlorophthalmus 391
proslinus, Myripristis 396
prosopotaenia, Pomacentrus 433
Prymnothonus hookeri 390
Psammoperca waigiensis 409
Pseudechidna brummeri 389
Pseudobatrachus dubius 447
Pseudocheilinus hexataenia 439
Pseudochromidae 412
Pseudochrominae 412

PAGE
Pseudochromis 412
fuscus 412
(Pseudochromis) fuscus 412
mccullochi 412
nebulosus 412
purpurascens 412
(Pseudochromis) purpurascens 412
tapeinosoma 412
(Leptochromis) tapeinosoma 412
Pseudogramma polyacanthus 412
Pseudogramminae 412
Pseudorhombus guttulatus 394
Pseudoscarus aff. moensi 440
chrysopoma 440
pectoralis 440
Pseudupeneus atrocingulatus 420
barberinoides 420
barberinus 420
bifasciatus 421
bilineatus 421
chrysonemus 421
cinnabarinus 421, 422
crassilabris 422
cyclostomus 421
(Hogbina) filamentosa 421
filamentosus 421
fraterculus 421
indicus 420
jansenii 422
jeffi 422
luteus 421
macronemus 420
multifasciatus 421
orientalis 421
pleurostigma 420
semifasciatus 421
spilurus 420
taeniatus 422
trifasciatus 421
Ptenonotus melanogenion 393
Pterocaesio tile 415
Pterois antennata 430
cincta 430
radiata 430
volitans 430
pterophthalmus, Anampses 436
Pteroplatea 386
poecilura 386
pterotum, Myctophum 392
puella, Teuthis 429
puellus, Siganus 429
pugnans, Papenua 442
pulchellus, Callyodon 440
pulcherrima, Coris 438
punctata, Harengula 387
punctato-fasciatus, Chaetodon 424
Gymnothorax 390
punctato-fasciatus, Lycodontis 390
punctatum, Diagramma 415
punctatus, Caranx 404
Drepane 423
Gerres 420
Ostracion 449
Pomacentrus 433
Siganus 429
punctulatus, Enneapterygius 445
Ophichthys (Callechelys) 389
puntang, Gnatholepis 443
Gobius 442
puntangoides, Gnatholepis 442
Gobius 442
purava, Thrissocles 387
purpurascens, Halichoeres 437
Nesiotes 412
Pseudochromis (Pseudochromis) 412
Seriola 403
purpurea, Anchoviella 387
purpureum, Thalassoma 438
puta, Terapon 416
Therapon 416
Pygoplites diacanthus 426

Q
PAGE
quadrilineatus, Pelates 416
quinquelineatus, Cheilodipterus 408
Chilodipterus 408
quinquestrigatus, Gobiodon 442
quinquevitttatus, Thalassoma 432
quoyi, Callyodon 440
Hemiramphus 393

R

Rachycentridae 406
Rachycentron canadum 406
canadus 406
radiata, Pterois 430
radiatus, Cheilinus 439
radja, Plectorhinchus 415
rafflesi, Chaetodon 424
rafflesii, Chaetodon 424
rafinesquei, Diaphus 392
raii, Brama 400, 423
Raja micrura 386
ramak, Lethrinus 417
Rastrelliger brachysoma 400
Chrysozonus 399
Rataboura 387
abbreviata 389
bicolor 389
javanica 389
macrocephala 389
microchir 389
Ratabouridae 389
rectangulus, Balistapus 448
rectifraenum, Pomacentrus 432
regani, Diaphus 392
regius, Lampris 394
reinhardti, Muraena 387
Myctophum 392
reinhardtii, Anguilla 387
remora, Echeneis 444
reticularis, Gymnothorax 390
Lycodontis 390
Tetrodon 449
reticulatus, Antennarius 450
Chaetodon 424
Lebistes 392
Lethrinus 417
retzii, Doryichthys 397
Rhabdamia cypselurus 407
rhabdotus, Carangus 404
Rhinobatidae 386
Rhinobatos granulatus 386
thouinianus 386
Rhinogobius aterrimus 443
baliuroides 443
malekulae 443
nebulosus 443
neophytus 443
Rhinoscopelus tenuiculus 392
rhodonotus, Pomacentrus 434
Pomacentrus (Pseudopomacentrus) 434
rhodopterus, Apogon 406
rhombeum, Zebrasoma 427
rhomboidichthys 394
Rhombosoma goldiei 398
richardsoni, Diaphus 392
Gymnothorax 390
richardsonii, Lethrinus 417
Lycodontis 390
rivulatus, Gobiodon 442
Lutianus 414
Lutjanus 414
robusta, Apogon 406
robustus, Nemipterus 418
rogaa, Cephalopholis 410
Perca 410
romeri, Pelates 416, 417
römeri, Therapon 416
rondeletii, Exonautes 394
rosenbergi, Amphiprion 431
rostratus, Lethrinus 417
Parexocoetus 393
rubellio, Holocentrus 395
rubens, Lutjanus 414

PAGE
ruber, Dentex 418
Holocentrus 394
Synagris 418
ruberrimus, Callyodon 440
rubescens, Cypselurus 393
rubrostriatus, Melanotaenia 398
Nematocentris 398
rubroviolaceus, Callyodon 440
rubrum, Holocentrum 394
rupelli, Lycodontis 390
rupestris, Kuhlia 408
ruppelli, Lycodontis 390
ruppellii, Gymnothorax 390
russelei, Trachynotus 406
russelii, Trachinotus 406
russelli, Lutianus 414
rutilans, Aphareus 413
Ruvettus, pretiosus 400

S

safgha, Ambassis 408
Salarias alboguttatus 446
aneitensis 445
bilitonensis 446
bilotonensis 446
biseriatus 446
caesius 446
caudolineatus 446
macneilli coloratus 446
coronatus 446
crenulatus 446
dussumieri 446
edentulus 446
fasciatus 445
fuscus 445
geminatus 446
gibbifrons 446
guttatus 445
irroratus 446
kellersi 445
lineatus 446
macneilli 446
marmoratus 445
meleagris 446
nitidus 445
niuafoouensis 446
periophthalmus 446
saliens 445
sindensis 445
sindeusis 445
tridactylus 445
unicolor 446
variolosus 445
walaensis 446
zebra 446
saliens, Salarias 445
salmoneus, Chanos 386
sammara, Holocentrum 396
Holocentrus 395
samoensis, Mulloides 420
Mulloidichthys 420
sanctae-helenae, Decapterus 403
sancti petri, Scomberoides 403
sandvicensis, Dules 409
Hepatus 427
sandwicensis, Eleotris 441
Kyphosus 419
sangiensis, Amia 407
Apogon 407
sanguineus, Myripristis 396
sansun, Caranx 405
Scomber 405
sarba, Chrysophrys 418
Sparus 418
Sardinella jussieu 387
melanura 387
sindensis 387
sirm 387
Saurida gracilis 391
grandisquamis 391
nebulosa 391
saurus, Elops 386
Saurus variegatus 391
saxatilis, Abudefduf 434

PAGE
scabra, Scorpaenodes 430
scapularis, Halichoeres 437
Scarichthys auritus 439
caerulopunctatus 439
Scaridea aerosa 439
zonarcha 439
Scarus galena 440
krausi 440
Scatophagidae 423
Scatophagus argus 423
multifasciatus 423
tetracanthus 423
sceleratus, Sphoeroides 449
Tetrodon 449
schauinslandii, Parapercis 445
schlegeli, Erythrocles 422
schmidti, Diaphus 392
schwanefeldi, Thalassoma 438
schwanefeldii, Thalassoma 438
Sciaenidae 422
schateri, Callogobius 443
Scoliodon dumerilii 385
Scolopsis bilineatus 416
cancellatus 415
ciliatus 416
leucotaenia 416
longulus 416
macrophthalmus 415
margaritifer 415
temporalis 416
trilineatus 416
Scomber brachysoma 400
kanagurta 399
lanceolatus 400
loo 399
malabaricus 405
sansun 405
Scomberoides lysan 403
orientalis 403
santi-petri 403
tala 403
tol 403
toloo 403
toloo parah 403
Scombridae 399
scopas, Amanses 448
Scopelus crassiceps 394
nigro-ocellatus 391
Scorpaena bynoensis 429
guamensis 429
novae-guineae 429
picta 429
Scorpaenidae 429
Scorpaenodes guamensis 429, 430
kelloggi 430
scabra 430
Scorpaenopsis cirrhosus 429
gibbosus 429
leonina 429
novae-guineae 429
scratchleyi, Engraulis 387
Thrissocles 387
scripta, Alutera 448
sculptus, Choeroichthys 396
Scuticaria pantherina 390
Scuticaria tigrina 390
Scyllium ornatum 385
Scyris indica 405
sebae, Ostracion 448
Sebastapistes albobrunneus 429
bynoensis 429
Sebastopsis kellogi 430
Sectator azureus 419
seheli, Liza 399
Mugil 399
Selar boops 403
crumenophthalmus 403
kuhlii 404
macrophthalmus 403
torvus 404
Semathunnus guildi 400
itosibi 400

PAGE
semicinctus, Lutianus 413
Lutjanus 413
Stethopterus 388
semicirculatus, Holacanthus 425
Pomacanthus 425
semidiscus, Hologymnosus 438
semidoliatus, Zonogobius 444
semifasciatus, Pomacentrus 434
Pseudupeneus 421
Upeneus 421
semipunctatus, Asterropterix 441
sephen, Dasyatis 386
Trygon 386
septemfasciatus, Serranus 410
Seriola dumerili 403
purpurascens 403
serpens, Ophisurus 388
serperaster, Apocryptes 444
Parapocryptes 444
serperastes, Apocryptes 444
Serranidae 409
Serranus areolatus 410
argyrogrammicus 413
bontoides 410
caeruleo-punctatus 411
chlorocephalus 410
corallicola 410
cyanostigma 409
daemelii 410
fasciatus 410
filamentosus 413
flavo-caeruleus 410
goldiei 410
hexagonatus 411
howlandi 410
maculatus 410
magnificus 410
malabaricus 411
merra 410, 411
septemfasciatus 410
sexfasciatus 410
socialis 410
stoliczkae 410
summana 411
tauvina 411
undulosus 410
servus, Terapon 416
setifer, Chaetodon 424
Gerres 419
Xiphasia 447
setifera, Gerreomorpha 419
setigera, Gerreomorpha 419
setirostris, Thrissocles 387
setosus, Pentapodus 418
sevenlineatus, Siganus 429
sexfasciatus, Abudefduf 434
Caranx 404
Caranx (Caranx) 404
Epinephelus 410
Serranus 410
sexlineatus, Grammistes 411
sexstriatus, Heteropyge 425
Holocentrus 425
sibi, Germo 400
Sicyopterus marquesensis 442
stimpsoni 442
taeniurus 422
sieboldii, Pristipomoides 413
Siganidae 428
Siganus argenteus 429
canaliculatus 428
concatenatus 429
doliatus 429
fuscescens 429
javus 428
lineatus 429
oramin 429
puellus 429
punctatus 429
sevenlineatus 429
spinus 429
vermiculatus 428
sihama, Sillago 422

PAGE
Sillago macrolepis 422
sihama 422
simsiang, Pomacentrus 433
sindensis, Clupea 387
Salarias 445
Sardinella 387
sindensis, Salarias 445
sinensis, Bostrichthys 441
sirm, Sardinella 387
smaragdus, Eviota 441
smithursti, Leiognathus 406
snyderi, Apogon 407
socialis, Serranus 410
solandri, Acanthocybium 400
Cybium 400
Solea persimilis 394
Soleidae 394
solorensis, Cirrhilabrus 439
sonta, Macgregorella 443
sordidus, Abudefduf 434
Callyodon 440
Glyphidodon 434
Glyphisodon 434
sorrah, Eulamia 385
spadiceus, Ophisurus 388
Sparidae 418
Sparus berda 418
cuvieri 418
malabaricus 414
sarba 418
spatula, Arius 391
Tachysurus 391
specificus, Lethrinus rostris 417
speciosus, Gnathanodon 405
speculum, Chaetodon 423
Sphagebranchus huysmani 388
polyophthalmus 389
Spheroides hypselogenion 449
Sphoeroides hypselogenion 449
lagocephalus 449
sceleratus 449
Sphyraena barracuda 399
forsteri 399
jello 399
liveriana 399
Sphyraenidae 399
Sphyrna zygaena 386
Sphyrnidae 386
spicifer, Syngnathus 397
spilistius, Pontinus 430
spilopterus, Cypselurus 394
spilopsoma, Monacanthus 448
spilura, Diacope 413
spilurus, Lutjanus 413
Pseudupeneus 420
Symphorus 418
spinifer, Holocentrus 395
spinosus, Dasyscopelus 391
Myctophum 391
spinus, Callyodon 440
Siganus 429
Spratelloides delicatulus 387
squamosus, Toxotes 423
Stegostoma tygrinum 385
steindachneri, Gymnothorax 390
stellatus, Caranx 404
Caranx (Caranx) 404
Gymnothorax 390
Tetrodon 449
Stephanolepis tomentosus 448
Stethojulis albovittata 436
axillaris 436
casturi 436
phekadopleura 436
trilineata 436
Stethopterus 388
semicinctus 388
stevensoni, Vailima 443
stimpsoni, Sicyopterus 442
Stiphodon elegans 442
Stolephorus delicatulus 386
insularum 387
japonicus 386

PAGE
stoliczkae, Serranus 410
striatus, Ctenochaetus 427
Synagris 418
strigangulus, Megaprotodon 425
strigata, Valenciennea 442
strigatus, Aeoliscus 398
Centriscus 398
Microcanthus 425
strigosus, Ctenochaetus 427
Ctenochetus 427
striolata, Teuthis 429
Strongylura choram 392
crocodila 392
incisa 392
indica 392
Strophidon brummeri 389
sufflavus, Pomacentrus 434
sulphureus, Upeneoides 422
Upeneus 421
summana, Serranus 411
surinamensis, Lobotes 413
suvarovensis, Pomacentrus 434
symmetricus, Myripristis 396
Symphorus spilurus 418
Synagris celebicus 418
furcosus 418
gracilis 418
luteus 418
nemurus 418
ruber 418
striatus 418
tolu 418
Synanceja verrucosa 431
Synancidium horridum 431
Synaptura orientalis 394
pan 394
Synchiropus microps 444
Syngnathidae 396
Syngnathoides biaculeatus 396
Syngnathus crenulatus 397
cuncalus 397
deokhata 397
djarong 397
intestinalis 397
spicifer 397
uncinatus 397
Synodus japonicus 391

T

Tachysacridae 391
Tachysurus froggatti 391
latirostris 391
spatula 391
Taenianotus citrinellus 431
triacanthus 431
taeniatus, Pseudupeneus 442
Tetrodon inermis var. 449
Upeneus 421
taeniopterus, Upeneus 421
taeniourus, Novaculichthys 439
Taeniura atra 386
taeniura, Dules 409
Kuhlia 409
taeniurus, Dules 409
Novacula 439
Novaculichthys 439
Sicyopterus 442
tapeinosoma, Pseudochromis 412
Pseudochromis (Leptochromis) 412
tala, Chorinemus 403
Scomberoides 403
talabonoides, Muroenesox 388
tapeinometopon, Seriola 403
taupo, Abudefduf 435
tauvina, Epinephelus 411
Serranus 411
temmincki, Alectis 405
Atherina 398
temminckii, Atherina 398
temporalis, Scolopsis 416
tenuiculum, Myctophum 392
tenuiculus, Rhinoscopelus 392

PAGE
Tephrosa piscatoria 428
Terapon cancellatus 416
caudovittatus 416
fuliginosus 416
jarbua 416
kneri 416
micracanthus 416
puta 416
servus 416
theraps 416
Teraponidae 416
ternatensis, Chromis 432
tetracanthus, Parapercis 445
Scatophagus 423
Tetracentrum apogonoides 408
Tetradrachmum carneum 432
Tetrapturus ectenes 400
illingworthi 400
kraussi 400
mazara 400
mitsukurii 400
Tetraroge albifrons 431
crista galli 431
Tetrodon hispidus 449
immaculatus 449
mappa 449
melcagris 449
nigropunctatus 449
reticularis 449
sceleratus 449
stellatus 449
inermis var. taeniatus 449
Tetrodontidae 449
Teuthis doliata 429
hexagonatus 429
lineata 429
marmorata 429
oramin 429
puella 429
striolata 429
troughtoni 427
vermiculatus 428
Thalassoma amblycephalus 438
balieui 438
ballieui 438
cranei 438
dorsale 438
duperrey 438
hardwicke 438
hardwicki 438
lunare 438
lutescens 438
melanochir 438
purpureum 438
quinquevittatus 432
schwanefeldi 438
schwanefeldii 438
trilobata 438
umbrostigma 438
umbrostygma 438
Therapon cancellatus 416
caudovittatus 416
chalybaeus 416
fuliginosus 417
habbemai 416
jarbua 416
nasutus 416
puta 416
römeri 416
theraps 416
theraps, Teraps 416
Therapon 416
thermalis, Apogon 407
thoburni, Mugil 399
thompsoni, Cubiceps 403
thouinianus, Rhinobatus 386
thrissa, Clupanodon 387
Thrissocles baelama 387
dussumieri 387
macrops 387
mystax 387
purava 387
scratchleyi 387
setirostris 387

PAGE

Thunnus orientalis 400
thynnus 400
Thynnus orientalis 400
thynnus, Thunnus 400
Thyrsoidea bullata 390
Thysanophrys crocodilus 431
tibicen, Centropyge 426
tiereoides, Holocentrus 395
tieroides, Holocentrum 395
tigrina, Scutitaria 390
tigrinus, Uropterygius 390
tile, Pterocaesio 415
tol, Chorinemus 403
Scomberoides 403
toloo, Chorinemus 403
Scomberoides 403
toloo parah, Scomberoides 403
toloparah, Chorinemus 403
tolu, Synagris 418
tomentosus, Monacanthus 448
Stephanolepis 448
torvus, Selar 404
Toxotes jaculator 423
squamosus 423
Toxotidae 423
Trachinocephalus myops 391
Trachinotus baillonii 406
blochii 405
botla 406
ovatus 405
russelii 406
Trachurops macrophthalmus 403
Trachurus trachurus 404
trachyacron, Myripristis 396
Trachycephalus bankiensis 431
Trachynotus jordani 405
ovatus 405
russelei 406
tragula, Upeneoides 422
Upeneus 421
triacanthus, Taenianotus 431
triangulum, Chaetodon 425
triastegus, Acanthurus 427
trichilus, Mugil 398
tricolor, Gomphosus 438
tridactylum, Eleutheronema 399
tridactyus, Polynemus 399
Salarias 445
trifascialis, Chaetodon 425
trifasciatus, Chaetodon 423
Glyphidodon 435
Parupeneus 421
Pseudupeneus 421
Upeneus 420
Trigla kumu 431
trilineata, Stethojulis 436
trilineatus, Pomacentrus 433
Scolopsis 416
trilobata, Thalassoma 434
trilobatus, Cheilinus 439
trimaculata, Amia 406
trimaculatus, Apogon 406
Dascyllus 432
Halichoeres 437
triostegus, Acanthurus 427
Chaetodon 426
tripunctatus, Pomacentrus 433
tropicus, Pomacentrus 433
troscheli, Callyodon 440
Mugil 399
trossula, Echidna 389
troughtoni, Teuthis 427
Trygon granulata 386
sephen 386
tuberculatus, Ostracion 448
tuberosus, Naso 428
tumidus, Vegetichthys 415
tutuilae, Drombus 443
tygrinum, Stegostoma 385
Tylosurus melanotus 392
typus, Carangichthys 405
Pristipomoides 413

U

PAGE

uisila, Atherina 398
ulietensis, Chaetodon 425
ultramarinus, Callyodon 440
Ulua 405
mandibularis 405
umbratilis, Jordanicus 447
umbrostigma, Thalassoma 438
umbrostygma, Thalassoma 438
uncinatus, Corythoichthys 397
Syngnathus 397
undulatus, Balistapus 448
Balistes 448
Cheilinus 439
Gymnothorax 390
undulosus, Serranus 410
unicolor, Plectorhinchus 415
Salarias 446
unicornis, Naso 428
unimaculatus, Abudefduf 435
Chaetodon 424
Glyphidodon 435
uniocellatus, Abudefduf 435
Holacanthus 426
unipinna, Caracanthus 431
unipunctatus, Holocentrus 395
Upeneoides bensasi 422
sulfureus 422
tragula 422
Upeneus 421
arge 421
atrocingulatus 420
trifasciatus var.
atrocingulatus 420
barberinus 420
bensasi 421
bifasciatus 421
chryserydros 421
cinnabarinus 421
cinnaborinus 421
filamentosus 421
cinnaborinus grandoculis 421
luteus 421
macronema 420
malabaricus 421
moana 421
multifasciatus 420, 421
pleurospilos 421
semifasciatus 421
sulphureus 421
taeniatus 421
taeniopterus 421
tragula 421
trifasciatus 420
vittatus 421
upolensis, Callyodon 440
Urogymnus asperrimus 386
urolampus, Diaphus 392
Uropterygius concolor 390
macrocephalus 390
marmoratus 390
tigrinus 390

V

vagabundus, Chaetodon 424
vaigiensis, Kyphosus 419
Leptoscarus 440
Liza 398
Lutjanus 414
Mugil 398
Vailima stevensoni 443
vaisiganus, Zenarchopterus 393
vaiuli, Pomacentrus 433
vaivasensis, Ambassis 408
Valenciennea aruensis 442
muralis 442
strigata 442
violifera 442
valentini, Aulostoma 398
vanicolensis, Mulloidichthys 420
Pempheris 412
variegatus, Lethrinus 417
Saurus 391

PAGE

variolosus, Cirripectes 445
Salarias 445
varius, Gomphosus 438
Heniochus 425
Vegetichthys tumidus 415
velifer, Zebrasoma 427
veliferum, Zebrasoma 427
venusta, Coris 437
vermicularis, Encheliophis 447
vermiculatus, Siganus 428
Teuthis 428
verrucosa, Synanceja 431
verticalis, Gobiodon 442
vidua, Balistes 447
villosa, Fistularia 398
violaceum, Holocentrum 395
violaceus, Holocentrus 395
Myripristis 396
Pomacentrus 433
Pristotis 433
violifera, Valenciennea 442
virescens, Aprion 413
viridescens, Balistes 448
viridis, Euleptorhamphus 392
Eviota 441
Hemiramphus 392
vitta, Lutianus 413
Lutjanus 413
vittatus, Upeneus 421
volitans, Exocoetus 393
Parapegasus 398
Pegasus 398
Pterois 430
vroliki, Holacanthus 426
vrolikii, Centropyge 426
Holacanthus 426
vulpes, Albula 386

W

waigiensis, Lethrinus 418
walaensis, Salarias 446
wardi, Pomacentrus 433
weberi, Apogon 406
wichmanni, Amia 406
woodlarkensis, Pempheris 412

X

xanthometopon, Heteropyge 425
Holacanthus 425
xanthopygus, Caranx 404
xanthotaenia, Lethrinus 417
xanthozona, Abudefduf 436
xanthurus, Abudefduf 435
Xiphasia setifer 447
Xiphasidae 447
Xystaema baconensis 419

Z

Zanclidae 426
Zanclus canescens 426
cornutus 426
zebra, Echidna 389
Salarias 446
Zebrasoma veliforum novae caledoniae 428
rhombeum 427
velifer 427
veliferum 427
Zenarchopterus dispar 393
kampeni 393
vaisiganus 393
zeylonicus, Microphis 431
zonarcha, Scaridea 439
zonatus, Abudefduf 436
Apsilus 413
Eviota 441
Zonogobius semidoliatus 444
zonularis, Callyodon 440
zonura, Eviota 441
zosterophora, Apogon 408
Archamia 408
zygaena, Sphyrna 386

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